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ABSTRACT

The report examines the development and implementation of performance indicators at institutions of higher education, through presentation of position statements on 11 countries: Australia, Austria, Canada, Denmark, Finland, France, Greece, Netherlands, Norway, Sweden, and United Kingdom. General conclusions are summarized in an introductory section and include the following observations: (1) there has been substantial development in the area of performance indicators over the past 2 years; (2) developments clearly reflect the importance of national and cultural settings, and the political agendas of governments figure strongly in performance indicator development; (3) the emerging relationship between performance indicators and funding mechanisms is of importance; (4) institutional self-regulation within well-defined institutional and systemic goals is desirable; (5) some governments are requesting that institutions prepare 3-5 year development plans; (6) there is concern as to the adequacy of the management information systems needed to sustain performance indicators; (7) while there is some satisfaction with progress made on indicators relating to research, much work remains in the domains of teaching, finance, and public service; and (8) of greatest concern is the problem of publication of indicators on a comparative basis across institutions. Appendices include documentation supporting some of the individual country reports. (DB)

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Programme on Institutional Management in Higher Education

THE DEVELOPMENT OF PERFORMANCE INDICATORS FOR HIGHER EDUCATION

A COMPENDIUM FOR ELEVEN COUNTRIES

Edited by H. R. Kells

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Programme on Institutional Management in Higher Education

THE DEVELOPMENT OF PERFORMANCE INDICATORS IN HIGHER EDUCATION

A Compendium for Eleven Countries

Edited by
H.R. Kells*

The opinions expressed in this document are those of the authors and do not commit either the Organisation or the national or local authorities concerned.

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INTRODUCTION

Performance indicators has been a topic high on the agenda of higher education since the beginning of the 1970's, both in terms of the interests of government and associated funding agencies and the institutions themselves. Performance indicators themselves, of course, are techniques developed to serve other ends as well, and need therefore to be considered in the much broader frameworks of the nature of government-institution relationships; processes of policy foundation and review; processes of institutional planning, resources allocation and evaluation; and the general area of institutional development and improvement. It is thus inevitable that indicators themselves cannot be viewed solely as technical devices, but have to be considered within a complex of macro and micropolitical tensions; within debates on the proper balance between accountability and institutional autonomy; within the context of changing patterns of public funding of higher education as a whole, and recognising the tensions between managerial and collegial cultures within institutions.

IMHE-OECD has been very active in stimulating research and discussion on these issues throughout this period. The topic has been on the agenda of all IMHE/General Conferences and, since 1978, four special topic workshops have been devoted to this theme. Three IMHE research projects have dealt with indicators for teaching and research, including an international survey covering 70 institutions in 15 OECD countries. The IMHE journal has also contained numerous articles on the topic.

The Directing Group of IMHE decided that it would be highly advantageous to all concerned to monitor developments in this field in a systematic and collaborative manner by setting up a Project Group consisting of a small number of experts from key countries in which the issue is being considered or in which major advances are taking place. The Group has the following terms of reference; to

1) maintain an on-going dialogue between major activists in the field;

2) enable participants to keep up to date with development in each other's countries;

3) enable participants to receive informal feedback and comment on their own developments and issues from other colleagues;

4) evaluate, seek out and pass on examples of good and promising practice, and distinguish the situational variables involved in particular cases;

5) report progress periodically to member institutions of the IMHE programme, and also to wider audiences within and without OECD.

The base for the operations of the Group is the Centre for Higher Education Management of the Anglia Business School at Danbury Park, UK, and the Steering Committee consists of Dr. David Bethel, formerly Director of Leicester Polytechnic, Dr. Paul LeVasseur, Head of the IMHE Programme; and Professors Herb Kells and John Davies of Danbury.

The first group meeting took place 23rd-26th January 1990 at Danbury with the principal objectives of:

1) informing participants of the state of the art of performance indicators and associated issues in members' systems, and acquiring an adequate working knowledge of the economic policy, governmental and institutional framework in which the developments are taking place;

2) identifying the prime issues involved in the development of performance indicators, arising out of participants' concerns, not only in terms of technical issues, but also in relation to broad processes of institutional evaluation, the governmental-institutional interface, and questions of institutional improvement strategies.

These objectives were accomplished through the analysis of detailed position statements on the development of performance indicators prepared by participants on their countries. These form the main part of this Compendium, and have been edited by Professor Herb Kells. It is emphasised that these are personal statements and interpretations and do not constitute the official view of either governments or funding agencies or OECD.

These position statements contain an extraordinarily rich source of material on performance indicators, both in terms of technical development and the organisational contexts in which they have developed. It is not the purpose of this introduction to provide a simplistic synthesis of this wealth of information, and the statements are warmly commended to readers in the nature of state-of-the-art analyses. However, some general observations may be made:

1) there has clearly been a substantial development in this area over the last two years. The basic starting points for development vary considerably which is reflected in the differing degrees of sophistication apparent in the statements.

2) developments clearly reflect the importance of national and cultural settings in the processes by which the systems have been legitimised, designed and implemented, and the political agenda of government figure very strongly, particularly in terms of the balance between the forces of public accountability, institutional autonomy and the so-called market in higher education. Consumers or constituents of performance indicator information vary widely in terms of their agenda of needs, and the use to which they put indicators.

3) the emerging relationship between performance indicators and funding mechanisms is certainly a matter of concern especially at institutional level, since this, in time, generates all manner of political dynamics within institutions and between institutions and funding authorities.

4) if one of the principal reasons for espousing indicators as part of an evaluative ethic is to stimulate institutional change in defined directions (leaving aside the question of whose directions!), then institutional self regulation, within a broad framework agreed with government, becomes of substantial significance. It follows that the growing interest in well defined institutional and systemic goals is a concomitant of this.

5) the emergence in several countries of government request for institutions' 3-5 year development plans brings with it the need for a monitoring process of considerably more sophistication than at present.

6) there is undoubtedly widespread concern as to the adequacy of the management information systems needed to sustain performance indicators. Progress on this is perceived to be a major priority and a shared activity between funding agencies and institutions.

7) whereas there is some satisfaction with the progress made on indicators relating to research, much work still remains in the domains of teaching, finance and public service.

8) perhaps of greatest concern to the Group was the vexed question of the publication of indicators on a comparative basis across institutions, and the subsequent translation into subject or institutional rankings. Whilst information may be innocent, the use to which it is put may not be. Clearly various parties use comparative rankings for their own purposes - the media, government, and indeed institutions themselves for their own marketing.

These are but some of the principal issues emerging for further consideration by the Group, which is now committed to a more detailed examination of the following areas as the next phase of its work:

1) performance indicators in government -- institution relationship, especially in the context of funding, and the processes of introducing complex systems.

2) performance indicators in teaching, and the relationship with research indicators in actual decision making.

3) performance indicators in institutional planning and resource allocation.

These will be reported on in November 1990.

The Steering Committee wishes to record its thanks to participants for producing the position statements and to sponsoring organisations for their support.

John L. Davies
Professor of Higher Education Management
and Dean of Anglia Business School

AUSTRALIA

THE CONTEXT

The face of higher education in Australia has changed dramatically in recent years. Over the last fifteen years or so the number of higher education institutions has been reduced drastically from more than 100 in the early 1970s to around 35 at present. In the same period the total number of students has almost doubled to around 450,000. The reduction in number of institutions has occurred through a progressive process of mergers, based on characteristics of minimal institution size, educational diversity and distance from other comparable institutions determined by the Federal Government as conditions of eligibility for funding, which since 1974 has come solely from the Federal Government. The current institutions are clearly much larger than those in earlier years. At the same time institutions have been largely freed from the influence of State coordinating authorities which in previous years had maintained a considerable degree of control over the non-university sector. Almost all of the current higher education institutions resemble and are called universities, and form part of the unified national system of higher education institutions which since the beginning of 1989 has replaced the former binary system. Funding for higher education institutions is based on a three year cycle with a guaranteed funding commitment. The primary basis for government funding is determined by student load with a differential weighting for different discipline areas and levels of academic award. At present there is no formal appraisal of institutional performance involved in the process of funding, other than that relating directly to achievement of the agreed student load.

THE DEVELOPMENT OF INTEREST IN PERFORMANCE INDICATORS

The development of performance indicators in Australian higher education has been a gradual process evolving from the general pressures for institutional accountability and efficiency which began in the early 1970s. The initial focus was on improvement of teaching and learning through the establishment of institutional centres for staff development and course evaluation, and on the introduction of regular departmental reviews using external as well as internal reviewers and covering in a systematic way both the teaching and research activities of the department being reviewed. A national Enquiry into Education, Training and Employment (chaired by Professor Sir Bruce Williams) which was established in 1976 and reported in 1979, recommended a checklist approach to this process of periodic review which would help to provide a common set of characteristics to be evaluated but which did not define any specific indicators for evaluating these characteristics. Subsequent reports on measures of efficiency and effectiveness commissioned by the former Commonwealth Tertiary Education Commission in the early 1980s made some advance in defining possible indicators and in exploring the general process of institutional evaluation, but did not attempt to establish a comprehensive set of indicators that could be applied at the system level.

This statement was prepared by Professor Russell Linke, Dean, Faculty of Education, University of Wollongong, N.S.W., Australia.

The first systematic attempt to apply a variety of performance indicators at the system level for the purpose of departmental and institutional comparison was made in the Review of the Discipline of Engineering released in June 1988. This was the second in a series of national discipline reviews initiated by the former Commonwealth Tertiary Education Commission, and included a detailed analysis of some 28 engineering schools with data on student preferences and entry scores, graduation and employment rates, student and graduate opinions of general teaching quality, and on staff publication and consultancy rates and provision of continuing education programs.

The matter of performance assessment was given a new and special emphasis with the release of the Commonwealth Policy Discussion Paper on Higher Education (The Green Paper) by the Hon. John Dawkins, Minister for Employment, Education and Training in December 1987.

The Green Paper proposed, for the first time in quite specific terms, that the issue of institutional performance in all its different forms had to be addressed on a quantitative basis, and that institutional funding should in some way be influenced by this performance. It stated:

> Performance Indicators
>
> The Government supports the development of a funding system that responds to institutional performance and the achievement of agreed goals. Even so, the development of reliable performance indicators is a difficult issue, particularly for service industries such as education whose activities are not always readily assessable in terms of their quantity, quality, durability and reliability.
>
> While it may be difficult at present to categorise and compare the outputs of the diverse activities of higher education institutions and their staff, the Government considers that an effective resource allocation system must have close regard to performance. At the simplest level, it is possible to measure system outcomes and efficiencies through student and staff data collections and unit cost comparisons. Both the Government and institutions have an interest in knowing whether their goals have been met in areas such as student and graduate numbers, and how efficiently those goals have been achieved.
>
> Since the primary focus of the higher education system is its teaching role, appropriate measures of quality as well as efficiency measures of graduate output are important. These might include peer review of teaching, student and employer surveys and external assessment. On the other hand, the assessment of quality and the return from certain activities such as basic research presents greater difficulties. Before the resource allocation process could be based solely on performance indicators in these area, far more developmental work needs to be done. In the interim, where judgements are required, the established process of peer review, such as is applied under the Australian Research Grants Scheme (ARGS) and in discipline reviews, appears to offer the greatest promise. That process takes into account traditional measures of scholarly activity such as publications, citations, consultancies and outside earnings as a guide to the level of performance, and weights them according to the issues under examination.

The Government intends to fund on output and performance, and will initiate moves in this direction during the 1989-91 triennium. Over this period funding will be based in part on performance measures such as the number of graduates and in part on total student load. The Government expects institutions, as part of their strategic planning, to give consideration to indicators that would help in measuring the achievement of their goals. In time, such indicators that are agreed to be useful would be built into the general funding system.

The need for performance indicators acceptable to both institutions and the Government points to the likelihood of further demands on the higher education statistical information base. This comprises a number of separate data collections undertaken by a variety of Commonwealth and State agencies and the higher education institutions themselves. Despite the size and range of these collections, a number of recent reports and submissions have drawn attention to their deficiencies. The matter of comparable statistics for universities and CAEs has been a problem until recently, and there remain some obvious gaps in areas such as student progress statistics, cost by field of study, and graduate and undergraduate costs. The continued development of a comprehensive, nationally consistent statistical base is of vital importance to both institutions and the Government and will be a high priority for the Department of Employment, Education and Training (DEET).

Reference: **Higher Education: A Policy Discussion Paper** circulated by the Hon. J.S. Dawkins MP, Minister for Employment, Education and Training, AGPS, Canberra, ACT, December 1987, pp. 41-42.

In response to this proposal, the Australian Vice-Chancellors Committee (AVCC) established a Working Party on Performance Indicators (later combining with representatives of the Australian Committee of Directors and Principals in Advanced Education (ACDP)) to identify a range of possible indicators for use in higher education institutions that would cover each of the major functions including both teaching and research, and which might also be applied at the broader system level. The Government welcomed this initiative and in its Policy Statement on Higher Education (the White Paper) released in July 1988 encouraged the further development of performance indicators along the lines proposed. The White Paper stated:

Performance Indicators

The Government supports the development of a funding system that responds to institutional performance and the achievement of mutually agreed goals. It intends to develop funding arrangements that take into account a range of output, quality and performance measures, and will initiate moves in this direction during the 1989-91 triennium. This, in turn, will require a comprehensive and nationally consistent data base, the continued development of which will be a high priority for DEET.

A partial range of performance indicators has been compiled in the context of the recent discipline review of engineering, including measures such as student satisfaction and completion rates, relative staffing levels and research publication and consultancy rates. These indicators reveal a wide variation in levels of performance between comparable institutions and departments. The engineering review represents an initial but important step in developing a more rigourous and systematic approach to the evaluation of performance against agreed educational goals, and provides a useful basis for extending and refining the range of appropriate performance measures.

In response to the proposals on performance assessment outlined in the Policy Discussion Paper, the AVCC and the ACDP have both established working parties which are co-operating in attempting to define a comprehensive and workable set of performance indicators for general application in higher education institutions. The Government welcomes this development and is prepared to support a joint approach aimed at establishing an appropriate set of measures on a national basis. Such an approach should involve wide consultation with institutions, State co-ordinating authorities and higher education staff and student associations, as well as other relevant bodies. The aim should be to determine a consistently defined and agreed set of measures that could be applied on a regular basis both by individual institutions and across the whole higher education system.

The range of indicators to be developed should cover such issues as student demand and course completion rates, quality of teaching and curriculum design, relative staffing provision and measures of academic staff performance in various aspects of research, publication, consultancy and other professional services. Indicators of performance against equity goals and measures of organisational efficiency should also be included in this process. As soon as practicable, indicators which are agreed to be useful and appropriate will be incorporated into the Commonwealth's general funding arrangements for higher education.

Reference: **Higher Education: A Policy Statement** circulated by the Hon. J.S. Dawkins MP, Minister for Employment, Education and Training, AGPS, Canberra, ACT, December 1988, pp. 85-86.

The AVCC/ACDP Working Party Report, released in December 1988, identified more than 30 possible performance indicators which could be applied at various levels from individual department to the system as a whole, together with a range of "institutional context" indicators which would need to be considered in examining any results of these performance measures (see Appendix A).

Following this Report, the Commonwealth Government established a Research Group in 1989 chaired by Professor Russell Linke to continue this development, and in particular to define in operational terms and conduct an empirical trial of the indicators identified in the Working Party Report with a view to system wide application of those considered feasible and appropriate. This project, established with the following terms of reference, is currently in progress and the Research Group is expected to report early in 1990.

HIGHER EDUCATION PERFORMANCE INDICATORS RESEARCH GROUP

Terms of Reference

1. The Research Group shall define and evaluate a range of performance indicators covering all the major functions of higher education institutions, which have the potential to:

   * provide at the system level a means by which institutional differences in performance may be quantified in comparable terms; and

   * enable institutions to assess their relative performance in particular departments or academic fields against that of similar departments or fields in other institutions.

2. In meeting these objectives, the Research Group shall:

   * build on work undertaken by the AVCC/ACDP Working Party on Performance Indicators;

   * take into account Australian Research Council initiatives on the development of research performance indicators to ensure compatibility of data requirements;

   * address the need to evaluate equity performance at the system level;

   * relate the proposed range of indicators as closely as possible to existing higher education data sources; and

   * conduct a limited trial to assess relevant performance indicators' systematic practicability for application at the system level.

3. The Research Group shall provide a report which sets out proposals on potential performance indicators and a detailed explanation of their practicability and conditions of use, including the means by which the necessary data should be collected and disseminated.

At this stage the Performance Indicators Research Group has completed the operational definitions of both context and performance indicators outlined in the AVCC/ACDP Report (See Appendix A) to conform as far as possible with the current specifications of the annual Commonwealth statistical data collections operated by the Department of Employment, Education and Training. Analysis of this data for fourteen higher education institutions which have agreed to participate in the trial project has been completed, and additional data has been sought directly from institutions and State admission agencies on indicators that can not be constructed from existing data sources but which, if practicable, could form the basis of future collections. Information on a possible measure of teaching quality has been sought directly from final year students, together with intended validation data from staff, though in practical terms such a measure could only be applied on a regular basis through the existing national survey of higher education graduates conducted by the Graduate Careers Council of Australia.

The final stage in the development of performance indicators, which has not yet been addressed in detail by the current Research Group, is to determine how, if at all, those indicators which seem to be both practicable and reliable may be used both in the process of internal institutional review and at the system level to influence the funding process.

GENERAL ISSUES AND PROBLEMS

One of the major problems in the development of performance indicators is the availability of adequate and reliable data. Most of what exists relates to educational inputs rather than outputs, and in this sense provides only the context for interpretation of performance measures rather than the measures themselves. But as the data base necessarily increases to accommodate more, and often more complex, measures it brings with it an increase in resistance from institutions to the cost of providing additional data as well as concerns about its reliability and the purposes for which it is required. More data does not necessarily mean better data, and it is the latter which is primarily required. Finding a reasonable balance between the necessary scope and reliability of system wide data remains an important issue in both the development and potential use of performance indicators.

Another major problem is that of comparability. Indicators are only meaningful if they are based on comparative scales that relate to academic organisational units (whether departments, faculties or institutions) of a similar kind. The classification of these organisational units and their level of aggregation is critical to both the collection and interpretation of institutional context and performance data. This problem is particularly important at the international level where there may be greater variability of organisational units which would tend to reduce the validity and reliability of comparative data.

A third problem inherent in the application of performance indicators is the risk of directing educational effort solely to the indicators themselves rather than to the more complex processes that they are intended to, but can only in part, reflect. While this cannot provide an adequate argument for ignoring the issue of performance appraisal it emphasises the need to ensure that whatever indicators may be used are related as closely as possible to the functions that institutions are expected to perform. A related issue is that of assessing quality in higher education, which cannot be measured solely in quantitative terms. How to define a set of indicators which have within them some judgment of quality performance is itself a very difficult task, and even if this can be achieved the indicators are likely to reflect the overall extent, not necessarily the quality, of performance across a number of different individuals and events.

At present the Government has no intention of applying performance indicators in a simple formula way to determine the general funding of higher education institutions. It is likely, however, that whatever system is used for general funding purposes will have some discretionary component (probably amounting to less than 10 percent of total Government funds), and it is possible that performance indicators could have some influence on the distribution of this component, perhaps by way of incentive funding for outstanding performance in particular areas of activity. It is likely too that indicators will be used by institutions themselves in monitoring their achievement against the goals defined in their respective development plans. Naturally all would welcome a better and more efficient data system to serve both institutional and government needs.

AUSTRIA

THE CONTEXT

The Structure of Higher Education

One of the most prominent features of higher education in Austria is the dominance of the university sector. Italy and Austria are the only OECD countries where the expansion of higher education was not accompanied by the expansion of non-university alternatives. The main reason was that a large part of the specific programmes which are met in other countries in the non-university sector are offered in Austria in vocational schools at the secondary level (*Berufsbildende Höhere Schulen, BHS*). Their strong and -- in comparison to international standards -- unique position has until now impeded an expansion of the non-university sector.

In the sixties, Austria followed the international trend to upgrade its higher vocational training from secondary to postsecondary level. The founding of teacher training academies (*Pädagogische Akademien*) and academies of social workers *(Sozialakademien*) was a start for a non-university sector. At the end of the sixties a plan for the development of a non-university sector, intended as an extension of the curriculum of the BHS, as which offer a commercial and technical training below the university level but at the same time a division into a four year secondary period and a two-year post-secondary period, was made. One of the purposes for this plan was to develop attractive non-university alternatives for the fast growing number of students with an entrance qualification (*Matura*). This plan was not realized because it was believed that in Austria no strong expansion for such programmes on the post-secondary level would take place and that attractive alternatives to the university were not necessary.

For the last 25 years only a few non-university alternatives have been offered to graduates from higher secondary schools:

- Academies for teacher training and for the training of social workers. The academies for teacher training were very popular for a long time, but since the mid-seventies they have lost many students because of teacher unemployment. The academies for the training of social workers have always enrolled only a small number of post-secondary students.

- The schools for medical-technical training, for which there is a strong demand, but which cannot be expanded due to space. For some of these schools there are seven times more applicants than available places.

This statement was prepared by Manfred Horvat, Vienna University of Technology and Hans Pechar, Federal Ministry of Science and Research

Legal, Financial and Administrative Aspects on the Federal Level

Higher education is not unified regarding legal, financial and administrative aspects. The university sector is financed and administered by the federal government. The non-university sector has a diversified financial and administrative structure.

Legislation in education is a federal responsibility. The organization of the university, its schools, as well as the study courses at universities are regulated by federal law. Further details are regulated by decrees of the responsible ministry. Universities and colleges of arts and music (*Kunsthochschulen*) are federal institutions. For the academies for teacher trainig and for the training of social workers not only the federal state but also the provinces (*Länder*) as well as private organizations take financial responsibility. The same applies to medical-technical schools.

Regarding the universities, the federal administration takes the following responsibilities:

. University budget and staff: allocation of funds to the universities; allocation of vacancies; university appointments (including those of professors); and staff management.

. University organization: establishment, nomination and dissolution of institutes; and nomination of posts of professors ordinarii.

. Teaching and learning: enactment of decrees, regulating study courses; establishment of degree courses at universities; and authorization of paid lectureships.

. University law: drafting bills concerning universities.

Except for the above mentioned responsibilities the unversity sector is characterized by self-government (*autonomer Wirkungsbereich*). The entire non-university sector is administered by the federal states or by the provinces. In addition to the above mentioned, such public administration has the following responsibilities: detailed allocation of space and resources; regulation of the curriculum; and detailed planning of the teaching and examination activities.

Organization and Administration at the Institutional Level

The university sector is regulated by organizational legislation which defines its autonomous areas and sets limits to central administrative involvement. The self-government aspects of universities are administered by its own executive bodies. At each level of university administration and management there are collegial and monocratic aspects. The rector and the academic senate are entrusted with the management of the entire university. The academic senate coordinates and controls the organs of self-government and acts also as an authority of public administration. The management of the departments is the responsibility of the faculty committees and of the deans. The management of the institutes is the responsibility of the heads of institutes (professors ordinarii and extraordinarii) and the institutes' assemblies. The latter is mainly an advisory body.

Rectors and deans are elected for a period of two years; re-election for a further term of office is possible. A university assembly, including representatives of the different groups at the university, elects the rector who has to be a professor ordinarius. Faculty committees elect the deans who are also professors ordinarii. The heads of institutes are elected by the respective institutes' assemblies.

The University Organization Act of 1975 brought about co-determination of the different groups of staff and of students, although not in terms of equal representation. In the past, collegial authorities have been composed only of professors.

The essential matters of autonomous decision-making covered by self-government are as follows: the election and co-ordination of university authorities; the assignment of new posts, new funds and new building facilities within the university; the selection of teaching staff (including recruitment of junior staff, granting of teaching authorizations, temporary teaching appointments, and proposals for the appointment of professors ordinarii and extraordinarii); and teaching and studies (including issuing of curricula, planning, coordination and performance of teaching as well as the administering of examinations and the award of academic degrees); and planning, co-ordination and carrying-out of research.

The non-university sector has no separate organizational act. There are no self-government organs with autonomous competence. The director of the academies is appointed for an unlimited term by the state or provincial officials. The responsibilities of the teaching faculty are limited to consultations with the director in educational matters as well as collegial assessments of the students.

Courses of Studies

Courses of studies at the Austrian universities are regulated by a four step system of study regulations, two of which are on the legislative, two on the decree basis. The "General Act on University Studies" (AHStG) deals in general with legal and organizational principles of university studies. Specific laws regulate the length of courses, examination subjects, procedures and academic degrees. The ministerial decrees on course schemes set a time frame for the required and optional courses. The curricula (decrees by university authorities) enumerate the didactic provision of subjects, the schedules and the prerequisites for admission to classes.

The educational function of the Austrian universities consists of various types of courses of studies. Professionally oriented training (master's courses) and scientific education (postgraduate doctoral studies) are by far the most important. The task of continuing education and adult education is fulfilled by special courses as well as different classes.

The university reform which was initiated in 1966 by the "General Act on University Studies" has lead to a more uniform university education. Today, nearly all study courses have the same or a similar structure. Master's courses are composed of two stages, each of which is completed after a diploma examination has been passed in one or in several disciplines. Before the final diploma examination, a thesis has to be submitted. Frequently, in the humanities and the natural sciences, the student has to take two different study courses. Students with a master's degree in the same

or an affiliated discipline are admitted to doctoral studies which require submitting a thesis and oral examinations in several subjects (*Rigorosum*). A course in medicine has three stages and leads to a doctor's degree.

Entrance Requirements

Generally, access to university requires a *Matura*. In some courses of studies, exams on additional subject matters may be required when these subjects were not sufficiently taught at the secondary school. Foreigners are admitted when their qualifications are equivalent to an Austrian *Matura*. In addition to the *Matura* there are some alternatives of university access (*Studienberechtigungsprüfung*). At the colleges of art and of music an entrance exam, which demonstrates artistic talent, is required. For some courses it replaces a *Matura*, in other cases it is an additional requirement.

There are no fees and no restrictions as to the number of students. Instead of a *numerus clausus* system for universities, the authorities have attempted to direct more students to the higher vocational schools at the secondary level. The majority of graduates of these schools enter employment immediatly. In contrast, graduates of higher secondary schools of general education remain in the educational system and attend university studies.

As opposed to the universities, the non-university sector has access restrictions. These restrictions are especially notable at the schools for medical-technical training. Besides these space restrictions the *Matura* is the main access requirement, although several alternative access opportunities exist.

Trends

Topics currently under discussion in higher education are the burden for universities caused by large numbers of enrolments, the lack of personnel, space and resources. The hope that the demographic development might reduce the stress for the universities has not been fulfilled. The growing entrance numbers has equalized the decline in birth rate.

In this context the expansion of the non-university sector has been suggested again. The topic is of interest because of Austria's application to join the European Community. Business and technical education, which is part of the post-secondary sector in almost all European countries, takes place in secondary schools (BHS) in Austria. There is a fear of disadvantages on the labour market for graduates of these schools.

Other points of discussion are the duration of study courses and the high drop out rates at Austrian universities. Hardly any students graduate within the required minimum of time, more than half of them take five or six semesters longer. This fact implies a rather advanced age of graduates and a late entrance into the labour market. In addition, the long duration of studies is a burden for universities as well.

The number of students who complete their courses has continuously declined in the past and the drop out rate is now about 50 per cent. Even though an incomplete university education is not necessarily a waste of time, either for the individual or for society, the high drop out rates point toward serious problems. One of the most important tasks for higher education will be the improvement of teaching. Increasing efforts are made to develop and use performance indicators in research and teaching. While there is a trend in that direction, the universities are under pressure for more responsibility and accountability, at the same time there are also trends towards greater autonomy for the university. There are indications that their decision-making competence is strengthened. But this requires an improvement of the managerial qualifications of all university organs.

PERFORMANCE INDICATORS AND RESOURCE ALLOCATION AT THE LEVEL OF THE CENTRAL ADMINISTRATION

In the eighties, in Austria as in most OECD-countries the discussions about the higher education system have changed. In the seventies the expansion of higher education and the question of equal opportunities had been priorities. More recently the topics are quality, the diversification of higher education and competition of higher education institutions. There have also been changes in the relationship between the government and the universities. There are doubts now concerning whether the growing influence of governmental regulations in the past and the strengthening of the steering functions of the state are appropriate to the university system. In discussions, at least, there seems to be consensus that the autonomy of universities and their capacity for self-regulation have to be strengthened. These concerns have resulted in an increased interest in the evaluation of higher self-regulation education systems. It is felt that assessments in higher education should apply different methods and approaches and should be performed at different levels.

Aims of performance indicators

In Austria it is thought that the use of performance indicators can serve different purposes. First, performance indicators are a means to make the allocation processes more publicly known. Thus, performance indicators make it possible to reveal inequalities in the distribution of resources. Those who are disadvantaged can use this information to endorse their demand for a larger share of the budget.

On the other hand, performance indicators can also support a different treatment of institutions. It is held that a strengthening of institutional autonomy is a prerequisite for more flexibility and competition between institutions. If competition is an aim, ways of a performance-oriented allocation of resources are required. Since research and teaching defy real market conditions, performance indicators which are the results of evaluation processes are a possible means for a performance-oriented allocation of resources.

Higher education statistics in Austria

The Austrian statistics on higher education provide accurate and actual data on the overall system. But on the levels of departments (*Fakultäten*) and institutes, data are inadequate. This is not a satisfactory situation because most of the decisions concerning the allocation of funds and personnel, which are taken by the central administration, refer to these levels.

One reason for the poor data-base on the departmental and institute level is that up to now there has been little interest in this kind of information. In Austria, statistics on higher education have been used mainly to inform the general public and parliament about the performance of the university system in general, e.g. by the "Report on Universities and Colleges", which is published every three years.

The head of institute (*Institutsvorstand*) is bound by the University Organisation Act (UOG paragraph 95) to submit a working report to the Federal Ministry of Science and Research every three years. That report comprises information on teaching and research activities of the institute in a unified format.

The data on teaching embrace:

- hours tought per week and semester by category of academic staff,
- number of remunerated lecturers,
- teaching activities of the division according to branch of study,
- number of diploma theses supervised by staff of the division.

Research activities of the institute are described by using the following indicators:

- number of dissertations,
- number of habilitations,
- number of scientific publications of academic staff subdivided in:
  + textbooks,
  + books and monographs (editions in German or other languages),
  + contributions to journals (Austrian, other German language and other journals),
  + other publications,
- participation in scientific meetings (with contribution),
- activities aiming at a broader public,
- funds from research funding bodies,
- consultancy and expertise,
- communicaton with respective institutes abroad,
- industrial contacts.

The collected reports of all Austrian university-institutes are published in a single volume every two or three years. In addition a data-base has been developed at the Federal Ministry of Science and Research on the basis of these periodic reports. There is no doubt that the collection contains valuable information on the performance of academic institutions

in Austria. But so far the data have not been used in a systematic manner in the allocation processes. However, most recently there is a growing interest in data which may support decision-making concerning the allocation of funds. It can be assumed that the report of the head of the institutes will be further developed

Allocation of resources

The way universities are funded by the government was established before the expansion of the higher education system. There is evidence now that this kind of an allocation procedure is inadequate to the increasing complexity of an expanding system. Important decisions are made rather informally and the basis of decisions is not evident. There are, of course, data on the university buget, which are published and which state the different items of expenditure and funds. But there are no publications on the distribution of funds to the different universities, departments and institutes. Similarly, there are hardly any explicit criteria for decisions on allocation. The fact that important issues are not discussed openly increases the influence of decision-makers at the federal as well as university level. A more open decision-making process and the use of performance indicators could alter this situation.

Upon application by the universities the annual budget is distributed to them by the responsible departments in the Ministry of Science and Research.

- Funds for personnel expenditure are obligations resulting from the assigned number of positions,
- Funds for the remuneration of lecturers are fixed quotas. The quotas cover the expenditure for teaching activities which are required by the curricula and not done by professors. There, too, is little room for redeployment.
- Most of the funds for administrative-operating expenditure are lump sum allocations, the university decides on the further issues.
- Funds for capital expenditure are distributed on application, decisions on larger acquisitions are made by the Ministry.

A Proposed Amendment to the University Organization Act concerning Performance Evaluation

At the moment the Austrian parliament is discussing an amendment to the University Organization Act concerning the evaluation of universities' performance in research, teaching and administration. It can be expected that the amendment will pass through parliament during the coming months.

The amendment would require the Federal Minister for Science and Research to evaluate the past performance of universities and their subdivisions, especially for purposes of planning and the formation of priority areas of research and teaching. The evaluation exercises would have to be performed periodically, in any case ahead of main structural changes and the definition of priority areas. The amendment clearly binds both the Federal Minister and the universities to continuous mutual information during evaluation procedures.

Based on the state of scientific knowledge on performance evaluation the Federal Minister would have to publish guidelines on modes of performance evaluation, submission of reports and collection of data for the respective purposes.

Proposals Regarding Performance Indicators

To assist decision-making concerning resource allocations at governmental level, more information on the flow of funds has to be collected and made publicly available. Up to now, only the total revenues and expenditure for universities and colleges, classified according to formal criteria or to items of expenditure, have been published. In the *Report on Universities and Colleges*, which is to be published in autumn 1990, the funds for the individual universities will be published. On the other hand performance indicators must be developed. The aim is to formulate performance indicators at the level of departments as indicated below.

Indicators grouped by type of decision:

a) Indicators relevant for all funding decisions:
- first enrolments
- total enrolments
- graduates
- number of study courses
- activities of academic staff:
  - publications
  - consultancies
  - participation in international conferencies
- chairs offered to Austrian academic staff members at foreign universities
- graduates/students ratio
- drop-out rates
- average length of courses

b) Indicators relevant for decisions on personnel expenditure:
- positions for
  - professors
  - junior academic staff members
  - non-academic staff members
- age profile of academic staff
- average salaries per type of post
- grants from the "Fund for the Promotion of Science and Research"
- other external earnings
- academic staff/non-academic staff ratio
- senior/junior academic staff ratio
- tenure ratio
- teaching load of academic staff
- number of theses guided

c) Indicators relevant for decisions on the remuneration of lecturers:
- academic staff per type of post
- number of readers (*Habilitierte, Nicht-Habilitierte*)
- senior/junior academic staff ratio
- staff/student ratio
- teaching load per type of post
- expenditures for remunerations

d) Indicators relevant for decisions on administrative-operating expenditure and on capital expenditure:
- grants from the "Fund for the Promotion of Science and Research"
- other external earnings
- research projects (number and size)

e) Indicators relevant for decisions on funds for libaries:
- use of libary resource
- number of books/journals
- library users/student ratio

Limits of the Model

The above-stated list of performance indicators has not yet been discussed sufficiently and is not based upon broad concensus. It is rather a first step formulated by these authors towards the development of performance indicators in Austria and an attempt to make performance indicators available to decision-makers. Therefore it is still impossible to give any information about the use and impact of performance indicators in decision-making. It is hard to foresee whether performance indicators will become accepted management tools for decision-makers. The value of performance indicators will be subject to further discussions.

The attempt to increase information on the equipment of and load on departments does not seem to meet with fierce resistance. Existing differences between departments will become more commonly known. But in this context the objections raised to performance indicators are that they take into account disciplinary particulars only inadequately .

These objections are correct if performance indicators are used to install reductionist and rigid formulae for decisions concerning the distribution of funds. There is no set of performance indicators which reflects the whole complexity of dimensions which have to be taken into account when deciding on the allocation of funds. Estimations, values and power will always have a considerable influence in decision-making. But the use of performance indicators may reduce and limit these uncertainties. In addition, performance indicators may help to make implicit estimations and values more explicit.

It is more difficult to allocate funds in a fair and performance-oriented manner. Which performance indicators are appropriate and how to interpret them? For example, does a high teaching load (high numbers of enrolments, large number of theses) indicate an achievement which has to be "rewarded"? Or does it rather indicate an unnecessary length of courses which has to be "punished"? Do high drop-out rates indicate a low standard of teaching or rather demanding programmes, a high standard of scientific work and excellence? Consensus on the interpretation of performance indicators is indispensable if they are to be useful. In addition, performance indicators are only useful if the autonomy of universities allows the universities to influence factors which are decisive in the allocation process. Hence, the discussion on performance indicators will be part of a general debate on higher education policy.

PERFORMANCE INDICATORS IN SECTORAL AND INSTITUTIONAL PLANNING, RESOURCE ALLOCATION AND REVIEW -- SOME EXAMPLES

During the 1980', a growing awareness did arise within the Austrian university system that a higher amount of rationality in academic decision processes is needed. The growing number of students and the steadily rising costs of research equipment caused considerations on accepted transparent procedures especially for the allocation of funds, personnel and rooms.

There is a general discussion going on at the level e.g. of the Austrian Rectors' Conference and other bodies. On the other hand, quite a number of procedures and approaches have been developed on the level of universities and departments as well as scientific bodies. The following chapters aim at giving a short impression of these developments without claiming completeness. Of course there is a long-standing and well-developed tradition of project oriented evaluation by research promoting funds that will not be dealt with in the present context.

The Austrian Research Association

The Austrian Research Association is a small funding institution concentrating on the promotion of interdisciplinar research and international mobility. In addition to the funding activities, several working groups deal with selected topics in the social sciences and humanities.

In July 1986, a Working Group for University Policies was formed. Influenced by the Jarrat Report and its consequences in the British higher education system, in March 1987 the group started to deal with the problem of quality in universities, ways to assure academic standards and methods of performance evaluation. In winter 1988 a report was published both offering a survey on essential published literature on the subject and proposing a pragmatic approach that should start from the definition of the institution's mission, functions and roles. The identification and application of performance indicators -- input, process and output indicators -- was highly recommended although the need for additional qualitative approaches was stressed. Evaluation by peer groups was described as an important tool both for periodic review and especially in connection with decisions of great moment.

In October 1990 the Austrian Research Association organized a symposium on University Performance, the findings of which have been published recently. At the moment a futher report is in preparation that will describe possible approaches to and practical aspects of performance evaluation in more detail.

The Working Group's work enhanced the discussion on performance evaluation both at the universities and at the political level. At the moment, several universities, departments and scientific societies are considering starting evaluation exercises. The above mentioned amendment to the University Organization Act can be seen as an outcome of this process too.

A Sectoral Example: The Evaluation of Physics Research

An important (sectoral) exercise has been started by the Austrian Physics Society (OPG) in 1989: The Evaluation of Physics Research in Austria. The Society has decided to evaluate physics research performed both in universities and other research institutions and -- to a certain extent -- in industry.

The purposes of the endeavour are:
- to increase efficiency,
- to establish and promote priority areas of research,
- to assure an optimal use of resources.

The OPG has designed a quite complex procedure that should assure the involvement and participation of the whole physics community in Austria. A first step was the organisation of an international symposium on "The Evaluation of Physics Research" where several lectures were given on international experiences with different approaches to evaluation. In two working groups with large attendance, methodological and political issues were discussed.

The general procedure is at first to prepare a detailed report on physics research in Austria. This document will be based mainly on the research data base FoDok-Austria which is described briefly below. In addition, several input and output indicators will be used.

The input indicators will take into account the following aspects:
- personnel,
- funds for the remuneration of lecturers,
- funds allocated from the federal budget,
- funds from research promotion foundations,
- funds from contract research.

The output indicators cover:
- research:
  - publications in reviewed journals,
  - invited survey papers,
  - contributions to monographs,
  - books;
- teaching:
  - obligatory lectures,
  - exercises tought,
  - optional teaching activities,
  - master's and doctoral theses;
- contributions to academic self-organisation:
  - chairmanships or memberships in committees;
- other services:
  - contributions in research institutes,
  - commissioned research for the government,
  - consultancy;
- other important activities of the institute:
  - organisation of scientific conferences.

In a second step a review committee -- that has been selected in a carefully designed participative process -- will study the report and subsequently visit all laboratories. After that a preliminary report will be prepared by the committee which will be discussed with those being evaluated. The final report will contain a description of the state of research, its strengths and weaknesses, and recommendations for future developments.

University Planning and Resource Allocations

Consideration of medium- and long-term institutional planning has increased during the last years. At several universities, rector's planning staff personnel has been established to collect and process data to prepare better founded academic decisions and to prepare the ground for developmental plans. In addition committees are dealing with these matters at the level of the academic senates.

In 1987 the Vienna University of Ecoromics presented a Report *Vienna University of Economics 2000* in which the present state of the university and its environment, the university mission and sectoral objectives, important measures with respect to research, teaching and services, and resources and financial funds are dealt with.

The need for performance evaluation is confirmed although there are no explicit explanations on appropriate procedures. In a recent publication, however, the new edition of the reports of the heads of institutes mentioned above has been comprehensively analysed by the Rector's planning staff to compare that University with the other universities in Austria and to formulate demands for more resources from the government on that basis.

Other examples of sectoral approaches to evaluation can be reported from Vienna University of Technology. The sectors covered have been the assessment of teaching load, the allocation of academic staff for research and the need for rooms. Different committees of the academic senate have dealt with those exercises. In the model for the allocation of research staff a combination of *ex post* and *ex ante* evaluation was applied. The output from past performance was taken into account by considering number and quality of publications, lectures at international conferences, research staff funded by research councils and industrial contractors and other special achievements. For the *ex ante* evaluation a research plan for the next five years had to be delivered. Both the assessment of teaching load and the evaluation of research activities has been successful in the sense that the Federal Ministry of Science and Research has allocated additional academic personnel to this university on the basis of the results of the self-initiated endeavours.

Departmental Planning and Resource Allocation

Starting about five years ago, at several universities departments set up committees to deal with problems of resource allocation and future development at the Department level.

Examples can be mentioned:

- reallocation of academic personnel at Graz University of Technology based on a weighted assessment of teaching load depending on different categories of teaching (and examining) activities;

- allocation of funds for administrative-operating expenditure at Leoben University of Mining following a formula where the equipment, academic and non-academic personnel, teaching load and category of the institute are taken into consideration using weighting factors; the formula for the allocation of funds for capital expenditure takes into account the teaching load, the number of academic staff and the number of publications.

- more complex formulas are used for the allocation of funds by the of Physics Department, Vienna University of Technology, where success in acquiring research funding, participation in international research programmes, number of reviewed and invited publications enter the calculations.

More examples could be mentioned. All have evolved from observed needs for well defined and generally accepted procedures for academic decisions. Since decisions at the universities in Austria follow democratic rules the chosen models had to be developed and decided in adequate social processes.

The Database for Research Information -- FoDok-Austria

In connection with the transparency of research activities an important Austrian achievment can be mentioned. Starting in 1983, the database FoDok-Austria which comprises detailed information both on the research potential and the research work in progress or completed in certain reporting periods by all Austrian universities has been developed by the University Extension Centre, Vienna University of Technology.

This database is updated approximately every two years and can be used to prepare basic reports on research performed in specific fields. A large and important pilot project is the preparation of the first general report for the evaluation of physics research in Austria which has been mentioned above.

FoDok-Austria contains data covering for every institute the main fields of work, academic personnel, equipment, cooperation with industry, international cooperation, research projects and relevant publications. On the basis of the information contained in the database a handbook with selected information on the research activities of the approximately 1000 institutes of the 18 Austrian universities and academies of art is published approximately every two years.

CONCLUSIONS AND OUTLOOK

From a central administration and an academic institutional point of view, the preceding describes some of the processes under way on different levels and in differnt parts of the Austrian system of higher education with respect to evaluation and the use of performance indicators. During recent years the Federal Ministry for Science and Research and some academic institutions have considered or actively developed and applied different formal approaches to cope with the problem of allocating resources taking into account past performance, at least to a certain extent. Quite a spectrum of procedures has been applied, the experiences collected representing a basis for a further evolution of performance orientation. There are existing data bases that can be used. Other data bases have to be further developed or newly established.

The amendment to the University Organization Act will bring about a new situation where the evaluation of institutional performance will become a constitutive aspect both of competition within and between the universities and of government-institutional relations.

CANADA

THE CONTEXT

Canada does not have a uniform system of education. Each province has exclusive authority over education in its jurisdiction and, therefore, has its own unique system of higher education.

Canada has 82 degree granting institutions with a full-time enrolment in 1987-88 of 486,062 and over 160 publicly funded non-degree granting institutions of higher education with a full-time enrolment of 319,136 in 1987-88.

The total expenditures on universities in 1987-88 were $7.7 billion and on colleges $3.1 billion. Funds for about 70 per cent of these expenditures comes from the provinces; federal funds account for 12 per cent; student fees for 9 per cent; and the remainder comes from other sources.

Universities are highly autonomous institutions in Canada; each generally operates under its own charter. Colleges also have significant amounts of autonomy but generally less than universities.

Various social and economic factors have created a climate of change in Canadian post-secondary systems. An aspect of this climate is an increased interest in such things as rational planning, institutional accountability, and so on. This, in turn, has lead to a growing interest in performance indicators.

THE DEVELOPMENT OF INTEREST IN PERFORMANCE INDICATORS

To date, formal performance indicator programs have not been widely used in the management of Canadian post-secondary institutions, but interest in education indicators in Canada is developing at both the national and provincial levels. At the national level, the federal and provincial governments are seeking comparable indicators to monitor the performance of the post-secondary system in relation to national objectives. At the provincial level, governments have an additional concern with the general management of their systems.

The most significant national level program is a joint Statistics Canada/Council of Ministers of Education, Canada, project which will produce descriptive indicators for post-secondary education in Canada.

Several provincial governments are undertaking reviews of their post-secondary systems. A desired outcome for many of these reviews is the implementation of mechanisms for monitoring system performance and achievement of public goals and objectives for post-secondary education.

This statement was prepared by Stephen Hawkins, Coordinator of the Research and Analysis Unit, Ontario Ministry of Colleges and Universities, Toronto, Canada.

National Indicators

The current interest in national education indicators stems directly from the National Forum on Post-Secondary Education which was held in October 1987. The objective of the Forum was "to explore the challenges and opportunities facing Canada's universities and colleges in preparation for the 21st century". One of the four key policy areas identified by the forum was the need for data and research on post-secondary education and a key component of this was the need for national indicators on post-secondary education.

The general themes to be addressed by the research and indicators programs were identified as:

- accessibility and the demand for post-secondary education;
- the outcomes and outputs of post-secondary education; and
- managing the post-secondary system and institutions.

It was recognized at the Forum that the development of education indicators in the Canadian context must be guided by an overarching concern with the comparability of the indicators across the various provincial systems of education. This in turn highlighted the need for shared information on post-secondary education which is as universally acceptable and useful as possible. The first steps in achieving the objectives set by the Forum have, therefore, concentrated on improving the national education database and developing descriptive indicators from that database.

Post-Secondary Education Databases

The databases held by provincial governments are generally limited in scope and designed to satisfy specific but increasingly multiple administrative needs. The only extensive database on post-secondary education at the national level is maintained by Statistics Canada, the federal statistical agency. It is this database which is being used in the national indicators project and by some provinces in developing their own indicators programs. Virtually all indicator programs at the national level obtain all or most of their information from the Statistics Canada database.

Statistics Canada operates a core data collection program and also conducts various education related surveys on a project basis. The methodology used by Statistics Canada allocates all education in Canada to one of three levels: elementary-secondary, trade/vocational or post-secondary. For the two levels of higher education the core program for the post-secondary level is the more comprehensive.

The Statistics Canada core program covers three aspects of post-secondary education: students, academic staff, and finance.

At the university level, the student database contains individual records for full-time and part-time students with the following types of data elements: age, gender, mother tongue, geographic origin, citizenship, field of study, type of qualification sought, progress towards degree, and educational activity last year. An annual survey is also conducted to obtain information on degrees granted. Much of this data is also at an individual student level.

The database on university academic staff contains individual records on full-time faculty with information on: age, gender, rank, year of appointment, degrees held, citizenship, salary, and principal subjects taught.

University financial data is maintained for total expenditures by fund (operating, sponsored research, ancillary enterprises) and by type of expenditure (salaries, library acquisitions, utilities, etc.); operating expenditures by function (instruction, library, computing, administration, student services, etc.) and type of expenditure; and revenues by direct source of funds.

The college database contains similar information though there is some aggregate reporting of student and faculty information in institutional level summaries.

Various methods are used by Statistics Canada to collect the data in their core program. Community colleges data is obtained from provincial departments of education where it is available and directly from the institutions where it is not. University data are generally collected directly from the institutions except where provinces collect the data themselves and then transfer them to Statistics Canada. Provincial expenditure data are obtained from provincial public accounts and federal expenditures from an annual survey of federal departments.

Among Statistics Canada's other education related activities are periodic surveys of higher education graduates which provide information on graduates job histories since graduation and their assessment of the fit between their education and employment.

Statistics Canada disseminates its information through a series of publications and aggregate data are available in a variety of machine-readable forms.

Canadian Education Statistics Program

In September 1989, Statistics Canada and the provincial governments, as represented by the Council of Ministers of Education, Canada (CMEC), signed a protocol establishing a Canadian Education Statistics Program. Two objectives of the Program, among others, are:

- to maintain a core of statistical information on education in Canada to be made up of an annual set of statistical indicators in the areas of elementary, secondary and post-secondary education and training; and

- to create national statistical information on education that will assist in the effective, efficient and economical management of institutions, systems and government agencies involved in education and training.

Two technical committees have been established to achieve these objectives. One is working in the elementary/secondary sector and the other in the post-secondary sector.

The post-secondary technical committee is developing a set of indicators on university education in Canada which are based on Statistics Canada data supplemented with provincial data where necessary. The indicators are being developed for each province and Canada as a whole. A significant effort has been made to ensure that the indicators are as comparable as possible across the provinces.

The indicators and the underlying data are scheduled for release by May 1990 and will be updated annually. Once the process of building a comprehensive and comparable database for the university sector is well under way, the committee will begin work on similar indicators for the college sector.

The set of university indicators will cover five areas: students, academic staff, finance, student aid, and research. The indicators are designed to show trends over the period 1977 to 1987. Some compare 1977 to 1987, others show year by year changes over the entire period. The specific indicators in each group are as follows:

Student Module
- Index of enrolment change
- Percentage of female students by status and level
- Proportion of population enrolled full-time and part-time by age groups
- Percentage of adult population with a university degree
- Net inter-provincial migration of students
- Percentage of graduates in arts based and science based programs
- Average tuition fees compared to consumer price index
- Percentage of international students

Academic Staff Module
- Change in number of faculty by rank
- Average age of faculty
- Percentage of faculty who are female
- Index of faculty salaries

Finance Module
- Total expenditures on university education and research as percent of gross domestic product (GDP)
- University general operating expenditures per full-time equivalent (FTE) student
- University general operating expenditures per capita and per person aged 18-29
- Provincial operating grants per FTE student
- Provincial expenditures on university education and research per thousand dollars of provincial gross personal income
- Provincial expenditures on university education and research per capita and per person aged 18-29
- Provincial expenditures on university education and research as a percent of total provincial government expenditures

Research Module
- University research expenditures as a percent of GDP
- Proportion of research expenditures by major field
- Index of change in research expenditures compared to CPI and total university operating expenditures

Student Aid Module
- Number of aid recipients as a percent of full-time enrolment
- Average amount of aid per recipient
- Average level of indebtedness upon completion of studies

Other National Indicator Projects

The federal government through the Department of the Secretary of State has a direct interest of its own in national education indicators.

The Secretary of State is responsible for two publications in the area. The first is the annual Report to Parliament, Federal and Provincial Support to Post-Secondary Education in Canada, which provides a federal perspective on the funding of post-secondary education in Canada. The second, Profile of Higher Education in Canada, is a general set of indicators, primarily at the national level, covering the following areas:

- institutions, students and teachers
- participation
- target groups
- outcomes
- expenditures
- research and development
- international comparisons

Another project conducted by the Ontario Council on University Affairs (OCUA), the Ontario Ministry of Colleges and Universities and the Council of Ontario Universities (COU) annually produces Interprovincial Comparisons of University Financing. This publication presents a set of indicators which describe how much financial support is provided to universities; how university spending is related to other government spending; and what proportion of provincial resources are directed towards university financing. This project is significant because it was one of the first indicator projects to systematically adjust indicators for structural differences among universities across the country.

Other groups such as the Association of Universities and Colleges of Canada also produce statistical compendiums which often contain indicators related to post-secondary education at the national level.

Provincial Indicator Initiatives

In addition to the national indicators projects a number of provinces have or are planning indicator projects. This discussion of provincial efforts is not intended to be an exhaustive account of the use of indicators by the provinces. Rather, it is intended to give some sense of the climate which is emerging across the country in which provincial governments are looking for formal procedures, often in the form of performance indicators, to ensure adequate levels of information for the management of their post-secondary institutions.

Alberta

While the Boards of Governors of Alberta's post-secondary institutions are expected to evaluate programs and effectively manage the resources of their institutions, the provincial department responsible for post-secondary education, Alberta Advanced Education, uses a number of basic indicators in reaching decisions on funding, accessibility and other aspects of the operations of their system. These indicators include such things as full-time equivalent (FTE) enrolments, weighted FTEs which take into account the relative costs of programs, overhead research costs, value of sponsored research, graduate data, and other information taken from the Statistics Canada database.

Currently, Alberta Advanced Education is moving to set-up a more formal system-wide system of indicators for post-secondary education in their province. These will play an important role in the round of system planning, coordination and development which is now under way.

The following principles form the basis of the planning process in Alberta:

Access: The Government of Alberta is committed to providing access to an array of post-secondary educational opportunities which respond to current and future needs as much as is possible within the resources made available.

Autonomy and Accountability: An appropriate balance should be maintained between public accountability and institutional autonomy.

Planning: Coordinated and cooperative planning by institutions and government is fostered in order that: (i) such departmental resources, as may be necessary, are planned for and are ultimately available; and (ii) system resources are used as effectively as possible.

The planning is taking place in a period of fiscal restraint which has limited the government's ability to fund new and update existing programs. In response to this climate of restraint, the government has expressed its intentions to rationalize the province's post-secondary system by ensuring that unnecessary duplication is minimized, that program gaps are addressed, that benefits of specialization are realized, and that ways are found to facilitate the ongoing renewal of each institution's core programs of study. The most important criteria to the Alberta government in this environment are institutional efficiency and effectiveness.

The department of Advanced Education has expressed a particular interest in indicators which could be used to:

- determine the relative costs of programs;
- measure faculty teaching and research workloads for performance evaluation and demand projection;
- assess the overall performance of institutions;
- evaluate the viability and utility of programs;
- measure the contribution of higher education to the attainment of economic objectives and other national and provincial goals.

British Columbia

The British Columbia Ministry of Advanced Education, Technology and Training routinely uses a number of basic indicators including:

- utilization rates (for example, funded enrolments/actual enrolments, space used/space available)
- faculty workload
- funding per full-time equivalent student
- course and degree completion rates
- graduate employment and job/education satisfaction rates
- various financial statistics

These indicators are used in the interest of:

- public accountability;
- assessing institutional and program quality; and
- making effective and efficient funding decisions.

British Columbia is initiating a new three year planning cycle for its institutions. Each post-secondary institution in the province is required to submit a detailed three-year plan which must address government priorities for post-secondary education. At the same time, the Ministry is moving to develop performance and outcomes measures to monitor the implementation of these plans.

Newfoundland

The Department of Education of the Government of Newfoundland and Labrador has made extensive use of performance indicators in a variety of contexts. The indicators have been used to chart the progress of their post-secondary system in relation to other systems; to manage the growth and evolution of post-secondary education in the province; and to measure the equity, effectiveness and efficiency of the system.

The most commonly used indicators include:

- retention rates
- participation rates
- graduation rates
- expenditure ratios
- annual growth patterns
- graduate employment success
- relationship between jobs acquired and training received
- income levels of graduates
- educational attainment of adults
- student characteristics (for purposes of measuring access)
- transition ratios from secondary to post-secondary

The Department of Education is in the process of developing a formal system of performance indicators. The first phase of this has been to implement an information system which currently holds data on students, programs, employment outcomes of graduates, institutional financial data, and student aid. It is planned to add information on apprenticeship, personnel, and research.

The non-university component of the Newfoundland post-secondary system has recently been restructured. This is being followed by a five-year planning process. As part of this process a formal hierarchy of goals and strategies has been established and the Department of Education will be using performance indicators and other evaluation mechanisms as part of this exercise to ensure that the prescribed goals are achieved.

A set of financial indicators is also being developed to evaluate budget proposals from Memorial University, the province's single university.

Ontario

Integral to Ontario's management of its post-secondary institutions are two advisory bodies, the Ontario Council on University Affairs (OCUA) and the Ontario Council of Regents for Colleges of Applied Arts and Technology. Both of these bodies are currently carrying out planning exercises which will result in recommendations concerning the future direction of Ontario's post-secondary system. The university planning exercise illustrates Ontario's approach to planning; the province's current objectives for its universities; and its emerging interest in performance indicators.

In response to a significant increase in participation rates in recent years and a need to enhance programs in some key areas, the Ontario government is making additional funds available to its universities. It has sought the advice of OCUA on a new approach to funding allocation which promotes a coordinated planned approach to future enrolment growth.

In initiating the planning process, the government identified a number of priority areas. These included:

- maintenance of 1988-89 admission levels;
- increasing science and engineering enrolments;
- increasing health science enrolments in target specialities;
- increasing teacher-education enrolments;
- increasing graduate enrolment to replace retiring faculty; and
- increasing French language programs.

The fundamental principles being followed in the Ontario planning process are that:

- the locus of planning should be in the institutions;
- the Council should be responsible for coordinating the development of institutional plans by ensuring adherence to the government priorities and by identifying and resolving conflicts in institutional plans; and
- institutions should be held accountable to OCUA and the government for meeting planned objectives in the priority areas.

It is felt that this approach will maintain a balance between institutional autonomy and public policy objectives.

The advice which OCUA will give the Ministry will likely include a set of recommendations concerning specific accountability mechanisms. Performance indicators will probably form a key component in these mechanisms. While basic indicators have always been used in Ontario's management and planning process, if the OCUA advice is adopted, the principle that universities should be formally accountable through the use of performance indicators would be new to the Ontario system.

SUMMARY

Currently, performance indicators are not widely used in Canada, at least not by governments. However, issues such as institutional accountability and efficiency, fiscal restraint, the need to monitor accessibility, rising participation in post-secondary education, demands for the rational utilization of post-secondary resources in the meeting of public objectives, and so, have created an atmosphere in which governments are beginning to turn to the use of performance indicators in the management of post-secondary education.

To date, most of the effort has been to develop descriptive rather than purely performance indicators. Because education is primarily a provincial responsibility, it most likely that provincial governments will show the greatest interest in performance indicators which could be used to assess the ability of post-secondary systems to achieve publicly declared goals and objectives. The federal government, on the other hand, will probably continue to monitor developments in post-secondary education using more descriptive types of indicators.

DENMARK

THE CONTEXT

As in other European countries, the Danish higher education system has expanded dramatically during the sixties and seventies. New institutions were built, there was rapid growth, general prosperity and a democratic ideology in the society. This created a basis for confrontation between the students, the younger group of newly employed teachers and the professors, who at that time were governing the institutions of higher education. As a consequence of the student revolt at the end of the sixties, The University Administration Act was adopted by the Parliament in 1970 giving significant influence to students in the goverment of the universities. The Act was extended in 1973 to all the institutions of higher education and also gave influence in the governing process to the technical-administrative staff. The teachers, the students and the technical staff are, according to the law, represented in the Senate and the Faculty Councils in the proportion 2:1:1. At the Board of Studies level there is a fifty-fifty balance between teachers and students.

The Act is founded on two basic principles giving the Board of Studies the responsibility for the study programmes and the faculties the responsibilites for the economy, the employment of academic personnel, awarding academic degrees etc. By this division of responsibility, the act gives rise to certain internal problems of coordination not only between the Faculty Council and the Study Boards, but also in relationship to the departmental councils that decide the allocation of duties between staffmembers. During the years the law has been criticized for being too democratic and ineffective, and critics have called for a closer management of the whole sector and a strengthening of leadership. On the other hand there is a general acceptance of the principle that the institutions of higher educations should be alloweded greater freedom to manage their internal affairs, but so far it has not been possible to find acceptance of another formula that better combines democracy with efficiency. Attempts to change the Act have been made, but they have not been accepted by a majority in the Parliament.

THE EVOLUTION OF PERFORMANCE INDICATORS, THE ASSUMPTIONS UNDERLYING THEIR DEVELOPMENT AND THE OPERATING CHARACTERISTICS OF THE SYSTEM.

In 1973, the Treasury published a long-term forecast of the most likely developments in the different major sectors of the public economy in light of current trends. The report showed quite clearly that the rise in the expenses of higher education and in other sectors of the public economy could not continue and had to be better controlled. In 1974 the Ministry of Education presented a general plan for improving the management of the higher education system. And later in 1974 The Directorate for Higher and Further Education

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This statement was prepared by Hugo von Linstow, Research Consultant, Danish Ministry of Education and Research, Copenhagen, Denmark.

was established with its first and main objective to carry out the plan. The central elements in the plan were: (1) - regulation af access to higher education, which meant restricted access to a number of educational areas and a more conscious planning of the student numbers in relation to broader study programme areas on the basis of societal needs and present labor marked experiences; and (2) - better information on student trends and labor market statistics. The word performance indicators was not used at that time, but in many ways it was information of that type that was wanted and to be used in the planning process; (3) - a budget reform which could improve efficiency and make the Ministry better able to control expenses; and (4) - a general study reform introducing bachelors, masters and Ph.D.-degrees.

It was, however, in 1976 that the Parliament finally adopted a law that gave the Minister of Education the power to regulate access to higher education and fix the student numbers within broader study programme areas. To that end labor market statistics and unemployment statistics were employed to provide better indicators of the present situation and needs for academic labor. The general theme for the redirection of the system was to change the interest of the students from programme areas with poor labor market employment perspectives to those with good perspectives. This campaign had some effect and the re gulation of access did the rest.

In 1980, a general budget reform was introduced based on the overall principle of ensuring transparency and comparability in the budgeting process. The reform intended that the total budget of each institution should be based on developments in teaching, research and other activities. The key element in the budgeting process should be the number of scientific personnel. Due to the fact that the requirements for technical staffing and other cost differs significantly within disciplines, the budgeting is based on the faculty level with rather different standards by faculty. Also, teaching and research was budgeted independently for two reasons. Due to the former free access and budgeting procedure it was, in fact, the students interest which determined the expansion and reduction of the research activities since research funding was linked to teaching. Previous experience had shown that these interests were not always in agreement with the broader societal needs for research. With the separate budgeting, the resources allocated to teaching could be increased or reduced without affecting the research resource allocation. For example, prognoses on the number of physicians showed a large overproduction due to former periods of free access. Therefore the student number to medicine was reduced. But the government had no intention of reducing the reasearch activities to the same extent. The model made it possible to take this into account in the budgeting process. The second reason is that the cost for the research activities and the teaching activities are different.

It has also to be emphasized that the teaching resources are not calculated directly on the basis of the number of students enrolled, but on actual student activity, (e.g. on registration each year of the number of "active" students). To make that posible every programme is divided up into a number elements in most cases corresponding to one year's study load. For example, master degrees in social sciences are composed of 4 elements in the registration process, the last element covering 2 years. An "active" student is a person that has passed an examination corresponding to one of the study progamme elements. By that the institution earns one "study step increment" (SSI). The SSI is in this respect a performance indicator measuring one year's full-time study of one student. The total student progress is recorded

by the institution and reported to the Ministry. By dividing the total number of earned SSI for each faculty by the SSI/scientific-staff ratio (which is similar to the student/staff ratio in other countries) one can calculate the number of scientific full-time working years allocated for teaching. And by using the other standards for administrative/technical staffing and other costs one gets the teaching appropriations. By using this method the Ministry avoids paying for students who still are enrolled at the institutions for higher education but not active.

In relation to research it has not been possible to identify a similar, simple output-related indicator which could be used in the budgeting process. So the number of full time scientific working years of research is so far kept more or less constant and only changed marginally.

The budget for teaching and the budget for research activities constitutes the professonal budget which is administered by the faculty councils (humanities, social sciences etc.). Budgets for other general activities, such as library functions, computer service centers and the general administration of the institutions (energy, rent, administrative service, cleaning etc.) is kept separate in the budgeting process.

By this division the general budgets become more transparent and can be compared within and between the professional areas as well as in respect to general cost. It should, however, be remembered that the previous description only relates to the appropriations to the institutions on the State Budget. Grants from other public or international science programmes are not included, and these economic contributions have increased rapidly during the last decade in size. They are of great importance to the scientific activities due to the fact that the general appropriations to the institutions have been more or less constant over the same period. There is a general understanding that the Ministry needs better information on these developments. When the budget reform was introduced it was very strongly opposed by the institutions. It was the intention of the Ministry to develop models of research budgeting for later implementation, but the discussed proposal was rejected by the institutions and no further progress has been made since with respect to budgeting for research.

By the regulation of access and through the budget reform the Ministry has been able to control the budget and secure changes in accordance with policy objectives. Although the changes were of a significant magnitude, the system was changed gradually to make it possible for the institutions to adjust to the new conditions. So faculties under reduction were cut down gradually and as a consequence the growing faculties were not given full credit during this period. This apparent injustice was justified by the recognition of the problems that were connected with the reduction of staff. As a consequence, the number of staff who have been dismissed over the period for economic reasons has been very few.

SOME RESULTS OF THE PROCESS WHICH EMPLOYED PERFORMANCE INDICATORS.

The period 1975-85 was a decade of Government budget deficits. Austerity in public expenditure therefore became a central objective from 1982 and the following years in the Goverment's overall economic recovery policy, and a balance on the budget was, in fact, achieved in 1986. The productivity of the institutions had to be increased if the budgets of the institutions for higher education had to be maintained, and due to the fact that general pressure for higher education in student numbers grew about 12 per cent during the period 1980 to 1988. The general budget has been more or less constant over the period, but with great differences between institutions and faculties. The following figures describe the trends in productivity:

	1980	1982	1988
Total budget of the higher education sector Dkr. millions)	4.350	4.300	4.600
Index.....	100	100	106
Total number of SSI (Student Step Increments)	48.000	48.500	59.500
Index.....	100	101	124

The figures indicates an increase in net productivity near 20 per cent.

Due to the central regulation of student numbers in programme areas, significant changes can be observed over the period, as seen below.

Regulation of Access to Higher Education 1980-1988 (masters degree level student numbers x 1000).

	1980	1988	(1980 = 100)
Technical education	2.860	5.190	181
Education within Natural Sciences	1.740	2.680	154
Education within Social Sciences	3.590	6.050	168
Education within Medicine	1.750	1.340	76
Education within Humanities (including Business Lang.)	3.870	3.350	86
Teacher education	6.070	4.940	81
Total	19.570	22.600	112

The same trends can be detected from analyses of graduates within the specific areas.

WEAKNESSES AND SHORTCOMINGS OF THE PROCESS WHICH EMPLOYED PERFORMANCE INDICATORS.

The Ministry has so far managed to fullfill the overall policy objectives of controlling the budget and have brought the educational system in better balance with the needs of the labor market. A system of professional long-term planning has also been implemented with special reference to research planning and allocation of posts to specific areas. There are, however, a number af weaknesses that can be summarized in the following way; (1) - Teaching and research activities are budgeted separately, but the Ministry does not know how the approriations, in fact, are used. All the figures which the Ministry uses are budget figures, not accounting figures; (2) - There is no centrally fixed teaching load and it is up to the collegiate bodies to decide with respect to the amount of resources allocated for teaching purposes, and to determine the teaching load and norms for preparation etc. The students often complain about the amount of teaching they receive, but there is no easy way to verify whether this is a sound critique. There is a need for much more transparency with regards to how teaching resources are actual spent; (3) - Often the institutions themselves are not aware of the consequences of their elaborated norm systems with respect to the amount to teaching load by area. This was documented recently by an internal investigation of one of the universities. And the Office of the General Auditor and the Treasury has critizied the Ministry for lack of knowledge on how resources are spent and has pointed out the need to elaborate the accounting systems so that they can match the budgeting purposes. By doing so, more specific and concrete accounting information on the cost of different educational programmes, research and other purposes could be produced. This raises however the problem of how to get reasonably accurate information on how the teachers are spending their working time. If that will not be possible, the calculation are not worth doing; (4) - Between 40 to 60 per cent of the professional resources are allocated to research, but we know very little about the research output and the quality of the research. Some research indicators have to be developed; (5) - The Ministry has the responsibility for most of the buildings. The Ministry has to monitor the general standards of the buildings and needs better information of standards of maintenance. In a number of cases, however, it is not possible to assess the level of general costs in this area and compare them with similar information for similar institutions unless one can relate them to square meters; (6) - With respect to mobility and age of personnel, the Ministry does not have easy access to the relevant information; and (7) - With respect to information on the study programmes, it is either not existing or not comparable between institutions.

It is the general view that the growing decentralization of authority in Danish higher education should be combined with more frequent evaluation of results. Self-evaluations, site-visits and other external evaluations demand good information of both qualitative and quantitative character (performance indicators). Lack of relevant quantitative information will make it difficult for the evaluators, and if the information is not at hand it is time-consuming and costly to collect it. That will again reduce the effectiveness of the monitoring process.

For these reasons and in order to achieve a more effective administration and management of the institutions of higher education, the Ministry has proposed the development of a general computerbased information system. The new system is supposed to be the general tool in the daily administration of the institutions but designed in a way that important information for the overall management of the institutions is provided at the same time.

The system is planned to be an integrated system and shall be developed in cooperation with the institutions of higher education. The primary purpose is to provide the institutions with new technology so that the normal administrative activities can be handled more effectively and at the same time strengthen the internal resource allocation and quality control in the process of managing the institutions. From these systems information in the form of actual statistics and performance indicators will be transmitted in an aggregated form to the Ministry and other governmental administrative bodies.

The project to develop the information system has already been critizied by the institutions with respect to the requirements for more relevant information on research activities and on the time used in actual teaching and research. With respect to other parts of the system, there is a general agreement between the Ministry and the institutions. At the moment it is not clear how this critique will influence the final design of the system.

The same trends can be detected from analyses of graduates within the specific area.

FINLAND

THE CONTEXT

The University of Helsinki (founded in Turku in 1640) was until 1908 the only institution of higher education in Finland. Today Finland has twenty university level institutions. The total number of students is about 100 000, the annual enrolment corresponding to almost 20 per cent of each age group.

Organized science policy and belief in national planning have been characteristic to the development of the Finnish system of research and higher education since the 1960s. Regional expansion of the HE system, democratization of the university administration, mission-oriented research promoting social progress, and a "syllabus reform" intended to narrow the gap between traditional academic and vocational education were the key ideas of the 70s. While each university has some degree of autonomy in its internal affairs, the Ministry of Education is the central unit of state administration of the research and HE system.

Research expenditure has grown rapidly during the 80s. In 1979 it was only 1.08 per cent of the gross national product, ten years later it has grown to 1.9 per cent. The plan is to increase it to 2.7 per cent during the next ten years. The most rapidly growing part of the research system has been applied research and development in industrial enterprises or institutes, but also basic research within the universities has received its share of the growth. The most important unit for allocating funds for basic research is the Academy of Finland with its fixed-term posts and grants for researchers, who do their work within the departments of the universities. The University of Helsinki also spends a substantial sum of its own financial resources to support research projects.

On the most general level, the planning of higher education is based on the Special Development Plan for Higher Education and the National Medium-term Economic Plan. The Development Plan, approved by the Government every four years for the next six-year period, sets out the overall objectives for the development of higher education, the areas of activity selected for emphasis, particular development projects in research and teaching, as well as changes in student numbers. Each university also has its own individual medium-term plan which is co-ordinated with the general economic plan for higher education as part of the national medium-term planning process.

Each university provides yearly budget proposals to the Ministry of Education, which afterwards conducts bilateral negotiations with the Ministry of Finance. Unresolved questions are decided in the budget negotiations, which involve the government as a whole. The state budget is finally accepted by the Parliament. The universities are not allowed to transfer funds between budget heads, nor can the universities negotiate individual salaries. However, recently some of the budget heads have been combined with each other, which means that the universities now have more power and responsibility to decide about the use of their funds.

This statement was prepared by Professor Ilkka Niiniluoto, Department of Philosophy, University of Helsinki, Helsinki, Finland. The assistance of Miss Eini Kiiskinen is also gratefully acknowledged.

During 1967 - 86 the guidelines for financing the universities were defined in a Higher Education Development Act. This act placed strong emphasis on the regional decentralization of the HE system. The student numbers for the main regions of the country were first fixed, and then the minimum teaching force and facilities were calculated. This means that the growth of the teaching and research personnel and facilities has primarily been directed to the new small "country-side" universities. This trend is still strong in national policy, especially in the allocation of new teaching posts to the universities.

A new Higher Education Development Act came in force in 1987. It guarantees that the funding of research and post-graduate studies in the universities will grow by 15per cent annually during a five-year period, but on the condition that the performance of the universities is accounted and evaluated. Resource planning, efficiency, flexibility, leadership, and accountability have thereby become the key words of the current science and university policy.

THE DEVELOPMENT OF PERFORMANCE INDICATORS AND INSTITUTIONAL EVALUATION

The recent interest in evaluation and indicators has arisen from several different sources: a) science studies ; b) two committees of basic research ; c) evaluations organized by the Academy of Finland ; d) decision making and annual reports in the universities ; e) development of the KOTA database, and f) legislative reforms.

Science studies. Evaluation and measurement of research has emerged in the 80s as an important problem area within the foundations of science policy. The Academy of Finland organized its first seminar on evaluation in 1981 (soon after the 1980 seminar on Indicators by OECD). The Finnish community of science studies -- originally sponsored by the Academy of Finland and later organized as the Finnish Society of Science Studies (1985) -- has discussed evaluation and science indicators from many perspectives. Philosophers have investigated measures of the success and progress of science, sociologists have studied the effectiveness and output of research groups, sociologists and library scientists have explored the use of science indicators and bibliometric methods. Bibliometric methods were used in a comparative analysis of Finnish and Hungarian science. Finnish scholars have participated in Nordic seminars on evaluation, and also organized seminars where the use of performance indicators is analysed in a critical spirit. The effect of these public discussions has been to make all concerned aware of the possibilities and dangers in the use of quantitative indicators of research and higher education.

Basic Research Committees. The "quality control" of science has traditionally been the responsibility of the scientific community itself. Motivation for increasing both internal and external evaluation has usually been based on economic reasons: the demand of more results (measured in terms of money), and the need to achieve more with smaller resources. This type of economic cost-benefit analysis of efficiency has been applied in Finland to the performance of technological research units and centers, but its appropriateness for basic research and non-vocational education is regarded as highly questionable.

Two important working groups appointed by the Ministry of Education, Basic Research Committees I (1980) and II (1984), demanded a "new deal" for research funds: the traditional principle of "equal shares" should be rejected and funds should be selectively concentrated where "the profit would be best in terms of research output". But these profits were not meant to be economic gains, but rather success in the international competition for recognition in science in the competition between scholars, research terms, departments, universities, and whole nations. In this model, performance indicators (such as rewards from the scientific community, research funding, publication counts, citation counts, etc.) and methods of evaluation (peer review of institutions and research groups) are needed to identify those with the best scientific results.

Peer review evaluation. Following the recommendation of the Basic Research Committee, the Academy of Finland started a series of evaluations of scientific disciplines in Finland. The evaluations use international experts who make site visits to research groups in different universities and give an assessment of the quality of their work and its promise for the future. The evaluation reports written by the international experts have among other things focused on the level of international cooperation among Finnish scientists, the extent to which Finnish researchers publish research results in journals with an international audience, and the length of study needed to complete the doctoral dissertation.

The first of these evaluations in 1983 created anxiety among those evaluated. But by now it is quite generally accepted that such an extended version of peer evaluation may be useful and informative -- even a necessary complement to quantitative science indicators, which cannot alone indicate the quality of research. However, as the third Basic Research Committee observed in 1989, evaluation by international groups is expensive and time consuming, so that they felt that reviewing all fields of basic research within 5 - 10 years was unrealistic.

University efforts. The universities have taken some initiative in developing and using performance indicators. The University of Helsinki started a reform of the Rector's Annual Report: it now contains statistical data about the activities (personnel, finances, teaching, examinations, research output, other scientific activities) on the departmental level.

In 1982 the Rector's Think Tank in the University of Helsinki proposed a measure for overall scientific productivity of a department. The University of Helsinki has also used since 1986 a model for calculating the shares of its eight faculties of the total sum of money for consumption, and an attempt has been made to create a model also for the allocation of the part-time teaching fees. The Faculty of Medicine in Helsinki has also used the scores in the citation index as one argument in academic appointments and in the distribution of research funds.

KOTA database. In the working group of the Ministry of Education on Improving the Methods of Evaluating the Performance of Universities, several proposals were made in 1985 for methods of evaluation and follow-up of university performance. The Group felt that evaluation of the performance of higher education is necessary and, if properly carried out, will help universities to direct their activity according to current or expected needs, to improve the quality of performance, and to make up deficiencies. The results of evaluation should be used primarily for decision making within an individual university or its various departments with respect to their own activities.

The Group proposed that the evaluation of different disciplines, launched by the Academy of Finland, will be continued and increased. But it also observed that a great variety of statistical data related to the productivity of universities has been collected and stored by different authorities. In practice there has been much overlapping work, the information flow has been slow, the data have not been easily comparable, and they have not been much utilized in planning. The working group therefore proposed that a database, called KOTA, be established. In addition, the working group proposed unifying and improving the annual reports of universities.

The Group reported that, with respect to the evaluation of research, it is impossible to develop a general method of evaluation and a system of indicators suitable for use in the annual allocation of resources. Still, evaluation of research at the level of universities and departments should be implemented as part of the overall evaluation of performance in these universities. The methodology being used in Finland to evaluate different areas of research should be examined and developed in accordance with the special needs of the nation.

With respect to the evaluation of teaching, the Group reported that only the quantitative efficiency of teaching can be measured on the basis of existing information systems and indicators. To improve evaluation of the quality of teaching, it was proposed that the quality be evaluated for each individual teaching period, the curricula be revised from time to time, national follow-up and evaluation seminars be organized for each subject area, surveys of the placement and career development of students be made, and research on higher education be increased.

With respect to input-output indicators of efficiency, the Group recommended that it is not necessary to develop many different indicators, but only a few that can be universally applied throughout every university and every faculty. It was also emphasized that since the use of indicators always requires familiarity with the background material in interpreting figures, the quality of performance cannot be measured by indicators.

The working group also expressed the opinion that, although the measurement of other activities of universities such as consulting, dissemination of the results of research to the general public, participation in public discussions, etc. is difficult, evaluation should nevertheless be made.

The second working group of Science Indicators in 1988 was asked to find out: a) how to collect information related to university research in an economic and rational manner; and b) to make proposals for content concerning research information in the KOTA database.

Legislative reforms. Until 1986 the allocation of resources for higher education was based on an Act dating back from the 1960's. The development of new legislation includes increase in funding for research and post-graduate studies in universities by 15per cent annually between 1988 - 1991. The government required that a performance evaluation system will be set up in all universities, which will provide comparative information about the results in research and in teaching as well as about the costs. The universities are required to report on their activities and the summaries will be included in the higher education development plans. The allocation of funds will be based on the results achieved in teaching and in research, and there will be a reallocation of funds depending on the changing needs.

ORGANISATIONAL MECHANISMS

The KOTA database

The Working Group on Improving the Method of Evaluating the Performance of Universities (1985) proposed that a system be established which would rationalize the scattered and partly overlapping collection of information and data. The Ministry of Education maintains the KOTA database. It is stored in the VAX 8650 mainframe of the Ministry at the State Computer Centre. All the institutions of higher education have access to it. The database can be reached through FUNET (Finnish University Network), and it is linked with some foreign computer networks as well. All the data contained in KOTA are public statistics.

The KOTA database does not contain data by departments or by individuals. Such information is available in the annual reports of the universities.

The definitions relating to content, concepts, classifications, and compilations are available in the database. The basic concepts and definitions to be used by the institutions in their own data files for purposes of the national data collection are defined in a KOTA manual published and annually updated by the Ministry of Education's Department for Higher Education and Research.

The database has included mainly simple indicators of teaching, but research indicators are also added to it in 1990. The information is provided by the universities.

The database contains the following higher education data by institution and by educational field from 1981 onwards:

- number of students
- number of degrees confered (masters, licentiate, doctorate)
- staff by rank
- costs
- supplementary training courses
- space, facilities

The information content and the applicability of the database is being further developed. The information on the year 1988 contains details on sources of income other than budgeted funds. The next compilation includes information on scientific publications, and Finnish research fellows working abroad.

Proposals for further development of the KOTA database

The Working Group on Science Indicators proposed that information describing research explicitly should be included in the KOTA database, so that research would be better taken into account while preparing the university budgets. The information should be collected by discipline and by university directly from the databases of the departments at the university. (See Appendix B.)

The proposals are based on an experiment using research indicators in ten universities. The following information is suggested for inclusion in the KOTA database:

1. External research funding
2. Scientific publication activities
   - scientific monographs
   - articles in scientific journals, edited publications and in printed congress publications
   - other scientific publications
3. Teachers and research fellows working in foreign universities (more than a month), including post-graduate studies abroad.
4. Foreign research fellows working in the department (over a month).

This information from 1988 onwards will be included in the KOTA database for three years on an experimental basis. After that an evaluation will be carried out to see if all the information mentioned above is relevant as research indicators for universities, and whether the department is a relevant unit for collecting information.

University databases

The Working Group on Science Indicators proposed that databases be established by 1991 at the universities, which will include the following information by department:

1. NUMBER OF TEACHING AND RESEARCH PERSONNEL

   number of professors, associate professors, assistant teachers, senior research fellows, research fellows, lecturers, teachers by hours, docents, research personnel, assisting personnel in teaching and research, library personnel, computer personnel, and other personnel

2. FINANCES

   expenditures by budget heads

3. RESEARCH FINANCED BY OUTSIDE SOURCES (contract research)

   Academy of Finland, TEKES, other governmental finances, finances provided by the municipalities, public and private enterprises, funds, societies and organizations, foreign countries and international organizations, and other

4. SCIENTIFIC ACTIVITIES

scientific publications (number)
(domestic and international separated)
- scientific monographs
- articles in scientific journals, edited publications and printed congress publications
- other scientific publications

Presentations in congresses

domestic/international

Scientific expert tasks
- editor of scientific journals (domestic/international)
- editor of publications
- member of board(s) of scientific societies (domestic/international)
- adversary in doctoral dissertations
- evaluation in appointment procedures

Working abroad in universities/research institutes (more than a month)

Foreign research fellows in Finnish universities (more than a month).

The Group recommended that universities also collect information about the results of their research, e.g. computer programs, algorithms, patents, prototypes, radio--, video-- and television programs etc. The departments should maintain databases which would provide basic information for use by the university itself (evaluation, planning, decision making), research statistics by discipline at the Statistical Office and for the KOTA database in the Ministry of Education, as well as for other university and scientific policy. The aim is that the basic information be collected only once and be comparable for all university in order to minimize the costs.

Universities are asked to develop databases and methodologies which will enable the evaluation and planning of research activities. The universities are also asked to consider the basis for the distribution of funds between different units, departments and projects. The working group has suggested that the basis for distribution of funds be research project proposals, an evaluation of their purpose and feasibility as well as the previous performance of the research team. The indicators describing the previous performance in research will inform the decision makers more about the state of the research activities and possible problems. It is still understood that the numerical values will not permit an evaluation of the quality of research. That has to be done in the research community according to its own principles.

In the internal division of funds at the universities a decision making process is needed. The evaluation criteria used have to be public and the process has to be followed up to sure that it functions. The most important instruments used by the Ministry of Education are the annual distribution of funds through the budget, including the preparation of a working plan for increases in salaries, expenditure and purchase of equipment and materials.

Application of performance criteria in decision making

The Ministry of Education applied as an indicator the number of post-graduate degrees in 1988 for distribution of (a part of) the increase in the funds for consumption and additional personnel. Other indicators used for operating costs were the number of professors and associate professors.

For the distribution of funds in 1989, the number of degrees (five year averages) was again used, but now in relation to the number of teachers and professors. More precisely, part of the increasing funds (less than 10 per cent) for consumption, equipment, and additional personnel was divided among the institutions according to the formula:

$$\frac{\text{basic degrees}}{\text{all teachers}} + 10\ \text{"X"}\ \frac{\text{post-graduate degrees}}{\text{professors}}\ .$$

This method was criticised, because it did not take into account the size of the institution. For 1990, this formula has been applied (with the weights 0.40 and 0.60 instead of 1 and 10) relative to the number of degrees expected from the institution (i.e., the official number of student intake recommended in the government plan).

The methods have provoked some criticism, although generally the application of output criteria in the distribution of resources has been accepted. The performance criteria are applied only to a relatively small part of the funding. On the other hand, the Ministry of Education tries at the same time to balance the "basic resource base" equally among the higher education institutions. Specific issues (new projects and national interests) are also taken into consideration. The Ministry of Education has made a study about the basic resource base of the universities which will be taken into consideration in the coming budget negotiations.

There has thus been a change in the approach of distributing funds: instead of giving defined limits for the use of funds the Ministry is setting goals and carrying out directive follow-up. There are given goals for the number of graduates, and the trend may be to reward those universities which come close to the set goals. The follow-up and reporting systems will be developed and attention is paid to cost-effectiveness. It seems problematic, however, how the two conflicting policies -- the old regional principle of equal basic resources and the new method of rewarding successful performance -- can be maintained together.

The Council for Higher Education has published in 1989 a small book Indikaatto reita, indikaattoreita, indikaattoreita which calculates from KOTA 88 for each major field (humanities, social sciences, natural sciences, ...) in each university the following relative performance indicators:

- students/teachers
- degrees/teachers
- costs (salaries, consumption, equipment)/students
- costs/degrees
- post-graduate degrees/professors

- post-graduate degrees/basic degrees
- other personnel/teachers
- consumption/students
- consumption/new students
- consumption/teachers
- consumption/professors
- equipment allocation/students
- equipment allocation/new students
- equipment allocation/teachers
- equipment allocation/professors

Also some faculties in the University of Helsinki have calculated indicators on the departmental level and used them informally in decision making. For example, the Faculty of Humanities is preparing a report of its activities, where for example the load and achievement in teaching is expressed relative to the number of teaching staff. This report will be used as a tool of planning the distribution of resources in the 90s.

ISSUES AND CONCERNS

In Finland the new quantitative indicators have been criticised and treated with some suspicion among the scientists, because no one has clearly told in advance how they will be used. For example, are they used for giving extra support to nonprogressive fields or to weed out those institutes or researchers who have not been successful enough? Further, it is not clear whether the collection of indicators will tend to influence perhaps in harmful ways the scientific traditions. For example, science indicators may lead to a conservative policy of favouring current practices. And it is not evident that the gains from the establishment and the employment of very extensive databases are really going to be larger than the needed efforts and investments.

One can compare two research evaluation methods; the traditional peer review and the new science indicators approach. The peer review has strong support. It is recognized that at its best the science indicators approach provides an objective, unique method for all subjects; but on the negative side, once the general use of indicators is well known and applied, it can cause artificial actions e.g. useless international contacts or gatherings of small groups which do not actually contribute to scientific advancement, but hold meetings and refer to each others writings. Also, indicators may register research activities which are actually counterproductive for development or for national economies. It is regretted that there is not enough research on science indicators and about what the indicators are actually measuring in different scientific fields.

The idea that indicators could provide a mechanical or "blind" method for deciding how to allocate resources has generally been rejected, both among the state bureaucrats and the scientists. Still, it is quite generally thought that they may be useful tools, if developed and applied so that the scholarly interests for high quality in university teaching and research are properly respected. Therefore, the new evaluation procedures are now acknowledged as a "matter of fact", with the reservations that the evaluation should be motivating and activating the scientific community and that the universities should be able to benefit from the evaluations.

It is easy to invent or construct performance indicators, but it is more difficult to interpret their significance and to measure them in a reliable way. Partly as a reflection of the current need to investigate the possibility, nature, and effects of performance indicators and bibliometric methods, there are now several proposals for establishing new research centers for science studies in Finland.

FRANCE

THE CONTEXT

As in most other countries, higher education in France comprises a university and a non-university sector, but these categories do not cover the same content as other countries for reasons connected with its historical origins. As in other European countries, higher education in France forms a system. The interdependence between the different parts of this system has at least three specific characteristics. First, regarding admissions, *baccalauréat* holders may be admitted into higher education. The *baccalauréat* is a diploma obtained at the end of secondary schooling, but, since Napoleon, it is, in law, the first diploma in higher education.

Admission, after the *baccalauréat*, to the various post-secondary courses of study is not subject to the same rules. The non-university sector emerged, with the first "*grandes écoles*", in the eighteenth century. These schools traditionally have a high-level professional slant and recruit their students by competitive examination. After the second world war, short technology courses began to appear. The present situation is complex. Selective admission, after the *baccalauréat*, is the rule in the *preparatory classes for the grandes écoles* (CPGE), in the short technology courses created in the 1950s (higher technician sections, STS) and 1960s (university institutes of technology, IUT) and, since the 1970s, in the university medical faculties (medicine, pharmacy). On the other hand, after the *baccalauréat*, admission is free of barriers to university courses leading to the university diploma in general studies (DEUG). Higher education thus has a "closed" structure and an "open" structure. The difference between the two systems is not selection or the lack of it; both employ forms of selection. The "closed" system selects on admission, while admission to the "open" system is free and selection takes place during the course of study. The interaction between the two systems often prompts the best bachelors to enroll in a CPGE, IUT or STS. The result is high DEUG failure and dropout rates in the universities. Since 1984, there has been a special policy to reduce these rates.

Selection for admission concerns not just courses which can be taken after the *baccalauréat*, but also courses that begin later during higher education. The distinction between the sectors practising selection on admission and those not doing so does not follow the division between the university and non-university sectors. The selective sector includes the CPGE, the *grandes écoles* and the STS outside the universities and, within the universities, the medical faculties, the IUTs, certain courses beginning two years after the *baccalauréat* (masters degrees in computer science applied to management, in science and technology, in management science and the *magistères* -- a new diploma created in 1985) and postgraduate studies. The distribution of student flows is not as simple as it may seem at first sight. Although the IUTs and the STS were intended to lead, after two years of study, to entry to working life, an increasing number of their students continue their studies, especially in the universities. The universities can take

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doctorate students from the *grandes écoles*. Most of the doctorate theses and research potential are to be found in the universities.

The major research agencies, for instance the *Centre National de la Recherche Scientifique* (CNRS) and the *Institut National de la Santé et de la Recherche Médicale* (INSERM), play an important part in assessing and funding research in higher education through the research units of the higher education institutions which are associated with these agencies.

Characteristics of the University Sector

The university sector is old, but the universities are young. The French Revolution abolished those which existed under the Ancien Régime. After the experience of the centralised Napoleonic system, the reforms at the end of the nineteenth century succeeded in introducing relatively autonomous faculties but failed to structure them as real universities. It was the *Loi d'Orientation de l'Enseignement Supérieur* (Higher Education Orientation Act) which in fact created the universities in 1968. It made them autonomous. Their autonomy, in teaching and research, administration and finance, was confirmed by a further Act in 1984. They have legal personality and their own budget. But this autonomy is exercised within a regulatory and institutional framework, three features of which must be pointed out.

University teaching is above all a preparation for national degrees or national competitive examinations. There are some university degrees, but only a minority of students take these courses. The regulations on national degrees no longer lay down detailed national curricula, as was the case before the 1968 Act. They set a framework which allows institutions appreciable room for their own initiative. The university draws up courses, within this framework, and applies to the Ministry to be authorised to award a particular national degree. Authorisation is granted after appraisal of the proposed programme, taking account of the resources likely to be used and national and local needs. This procedure aims to guarantee the quality of the course.

University research is funded by a twofold system. The principle of this twofold system is not peculiar to France, but France applies it in its own way. First, the universities are provided with research staff and appropriations by the Ministry. Second, the major research agencies, which administer the staff and funds concerned, allot resources to research laboratories (not the universities).

The staff are mainly State officials. The corresponding posts are entered in the central government budget, not that of the university. The State can withdraw or reallocate them if they fall vacant. Their incumbents are paid directly by the State. The university cannot therefore choose between wage expenditure and other recurrent expenditure. At the same time, the careers of teaching staff depend less on the university than on national university bodies. The premises are usually State property, and until 1988 the State was responsible for maintaining them. The funding shown in the university budget, accordingly, is additional to the major funding (mainly staff expenditure) which is not shown there.

Trends in Higher Education

The expected increase in the number of students will be particularly rapid up to 1993. It should then continue at a slower pace. This quantitative growth makes the qualitative improvement of higher education more urgent, as it must accommodate bigger student flows and, at the same time, develop European centres of excellence. This is being tackled through greater autonomy and responsibility for the universities. In 1989 one step was taken in this direction by making institutions responsible for maintaining their premises and giving them broader-based operating grants. This has been accompanied by a policy of contracts.

THE DEVELOPMENT OF THE EVALUATION AND MONITORING MECHANISMS

The contractual policy sets a framework which allows institutions to design and implement a development project that responds both to their own needs and to national objectives. It aims to broaden the autonomy of the universities while retaining the State's guiding role and its responsibility for coherence countrywide. The approach is one where each institution sets its own policy, and central government approves the institutional policy. It means that the university decides on its strategy, targets and the ways of achieving them, that it obtains the Ministry's approval and that its results are evaluated. The decisions are still subject to the principle of annual budgeting, but they are part of a multiannual programme.

Developments during the 1980s.

The first venture in contractual policy concerns research. Since 1977, the funding of education and research has been gradually split. Research funding covers research programmes and equipment, and the construction, maintenance and repair of research buildings. But it does not cover the part of the wage bill corresponding to the research activity of the academic staff. In 1983, four-year research contracts began to be negotiated between the Ministry and the institutions. They came into general use within three years.

Apart from research, the contractual method is only used for special purposes: reform of university first degree courses in order to reduce failures and dropouts, documentary contracts, etc.

More ambitiously, the Act of 26th January, 1984 provides that training, research and documentation activities may be the subject of multiannual institutional contracts. It also set up a *Comité National d'Evaluation* (CNE). But although this evaluation committee has been in existence since 1985 and is actually operating, the provision on institutional contracts was not applied up to 1989, except as described above.

Comité National d'Evaluation

A standing committee, the CNE is responsible for three types of evaluation. The first concerns institutions. Its aim is not to assess people (the domain of the *Conseil National des Universités*, CNU), courses (covered by the procedures for authorising the award of national degrees) or the research laboratories associated with the CNRS (role of the *Comité National de la Recherche Scientifique*). As far as possible, the CNE uses the findings of the

bodies qualified in these areas. It considers institutions as such and analyses their strengths and weaknesses. The second type of evaluation concerns sectoral (e.g. geography in France) or crosscutting issues (e.g. research and the university). The third covers higher education as a whole.

These evaluations are intended for three categories of user. They provide the government with diagnoses, but they also make two contributions to the institutions evaluated. First, they are audits which contain recommendations and should eventually enable the institutions themselves to carry out a self-appraisal. Secondly, they inform the government of institutions' special problems and successes. They also provide the general public (students, parents, business, local government) with reliable information.

As a national committee, the CNE performs its evaluation tasks with the help of eminent people who are independent both of institutions and the government. The Education Act of 10th July, 1989 gave it independent administrative authority status. On the other hand, it has no decision-making powers. It does not make any grants nor issue any regulations. The Ministry itself has to take such action as it considers advisable.

The members of the CNE are appointed, for a non-renewable term of 4 years, by decree of the President of the Republic in the Council of Ministers. They number 17, 11 of whom represent the scientific community, and are chosen from lists submitted by the chairmen of the CNU sections, the chairmen of the CNRS sections and the *Institut de France*. Six members represent the *Conseil Economique et Social*, the *Conseil d'Etat* and the *Cour des Comptes* (government accounting office).

The method of evaluation is pragmatic, alternating between phases of compiling written information and expert missions in the field. It employs quantitative criteria and a qualitative approach. The information comes from the Ministry, the major research agencies and institutions. It seems that institutions often do not know enough about themselves and need to improve their information systems. After consultation with the Conference of University Presidents, the CNE has drawn up a list of criteria and indicators. But the data and indicators have to be interpreted, and the CNE stresses that this must be done very carefully. In evaluation, pride of place falls to the qualitative approach, to external peer appraisal.

The CNE wants evaluation to become increasingly a concerted approach. Each institution will have to collect the essential quantitative data and make the qualitative analyses appropriate to its own intrinsic features. Evaluation should above all throw light on the institution's strategy. It should be noted that the CNE has carried out an evaluation of a third of the universities, in all cases at their request, although the CNE can decide for itself which institutions it wants to evaluate.

Contractual policy and evaluation

While CNE evaluation is careful to respect the autonomy of the universities, the greater autonomy being developed under contractual policy should make the role of evaluation more important. The year 1989 was in fact marked by the extension of the contract principle to all the activities of

institutions. The latter are split into four groups. Each half-year, from the second half of 1989 to the first half of 1991, institutions in one given group have to negotiate their contract. The contract is for a four-year period and is in principle all-embracing. However, as all the research contracts had not yet expired, the first contracts with institutions covered non-research activities only. The contractual policy will later achieve total coverage.

The purpose is not to rank institutions or their departments, or make them compete for the allocation of resources by bidding. It is to allow the university the initiative for its own development proposals and to come to an agreement on their execution. The contracts are concerted development programmes. The premises, staff and grants required are the subject of indicative programming.

Drafting the contracts makes institutions specify their objectives. This is of benefit when evaluating the results. It also helps to update the methods used for this purpose. The performance indicators are largely those of the CNE. But the introduction of the contractual policy provides an inducement to build up standard data bases. The indicators must not be used mechanically. They must be turned to and employed as a source of useful information for evaluation. For example, failures and dropouts during the first two years of university study partly concern bachelors who come from specialised secondary studies and find it more difficult to follow general studies. Interpretation of the failure and dropout rates must allow for students' school origins: these indicators have to be considered at the same time as "environment indicators". The CNE has already paid special attention to indicators relating to research. This work needs to be continued, and to extend into teaching and other activities (management, etc.).

Performance of contracts is monitored. The first contracts will be reviewed halfway through. The results of the contracts will be evaluated on completion, i.e. after 4 years, and discussions are being held on what this will entail. The procedure for using the indicators must be defined and will not necessarily be the same for every discipline, course or type of institution. Co-operation between the central authorities and the CNE should help harmonise their respective tasks and roles as regards evaluation. A new system of distributing resources is under study, and the question is the sort of relationship that ought to be established (or avoided) between resource distribution and evaluation.

The twofold aim of encouraging diversity in education and research and safeguarding standards ought to help the universities reconcile a rising intake of students with the pursuit of quality research. The formation of European centres of excellence through the rapprochement of existing institutions is accompanied by an external evaluation structure.

THE CONTEXT

The social pressure for university education in Greece is very strong. The constantly growing figures of unemployed university graduates (engineers, accountants, physisists, teachers, etc) do not diminish this pressure. Entrance examinations are extremely competitive; only one out of four applicants is admitted to higher education, about half of them in universities and half in the 3-year polytechnics. There has never been a national long-term plan indicating specialties or professions with excess of, or demand for, graduates.

There are seventeen (17) universities, six of them not more than 20 years old (two of them, the University of Thessalia and the Ionian University, with a few students and teaching staff). The number of students entering universities per year through entrance examinations is about 23,000. About 3,000-5,000 more enter through other (legal) means. The Ministry of Education essentially decides on the number of entrants per university department. Each department is routinely asked, every year, to indicate how many students it can accept but as a rule, they get many more than the number they ask for. Students pay no tuition fees. All textbooks are distributed free of charge. For 15 per cent-20 per cent of the students there is free room. For most of the students there is free board. The 1975 Constitution of Greece does not allow the creation of private universities. Yet, anyone who can afford it can go and study abroad. Today, about 60,000 to 70,000 students study abroad (mainly in EEC countries) paying full tuition and bearing other expenses.

For most departments, the duration of studies is 4 years (it is 5 for engineering, 6 for medicine). The average length of student stay at a university is longer than the nominal duration figure. Class attendance is not compulsory, except for some laboratory courses. For each course there must be a specific textbook or set of notes which is given out to every student registered for the course.

The higher education system is highly centralized in regard to funding, salaries and expansion of universities or departments, but extremely decentralized in regard to curriculum requirements and planning, teaching, staff promotions, and research. There is a formal Council of Higher Education which advises the Minister of Education. Members of this Council are the Rectors of all universities, five students, representatives of all political parties represented in Parliament, and representatives of: the Technical Chamber, the Chamber of Commerce, the Lawyers Association, the Medical Association, the General Federation of Workers, among others. Over the last 10 years, there is a tendency in the direction of more university autonomy, and ; this is in accordance with the Constitution.

This statement was prepared by Professor Demetrios Panagiotakipoulous, Demecritos University of Thrace, Xanthi, Thrace, Greece.

Rectors, deans and department chairmen are elected by a special body comprised of all teaching staff (professors, associate professors, assistant professors and lecturers) plus an equal number of students designated through student elections. Most crucial decisions on curriculum formulation and development, structure of courses, selection of textbooks, leaves of the teaching staff, forming of Ph.D. Committees and participation in an ERASMUS or COMETT program and the like are taken at the department level by a Department General Assembly (DGA) which consists of all teaching staff plus 50 per cent as many students.

As society's and government's expectations of the universities are not matched by analogous planning and funding, the notion of "value for money" and of "accountability" are not as easily addressed in Greece at the institutional level as in some other OECD countries.

UNIVERSITY FUNDING STAFFING AND ACCOUNTABILITY

There are two major sources of funds: 1) The Ministry of Education and 2) Other private or public research funds. The Ministry funds cover all operating expenses and investments (buildings, equipment, teaching and research, student textbooks, student housing and meals). All salaries are covered independently, directly from the national budget. Universities submit annual budget proposals by early Fall. The Ministry of Education gets a national budget share, for universities, by late Fall. The allocation of funds to each University comes about by early Spring. Normally, there is an annual budget increase covering inflation. The allocation of funds to the universities is essentially decided by the Council of Higher Education. The criteria used are the following: 1) Stage of Development -- Universities are distinguished into two groups: "old" and "new". The group of the "new" ones get a small additional portion of the total available budget, on the basis of specific recognized development needs. All universities are supposed to have 5-year development plans. The remaining major portion is distributed to all universities according the other three criteria; 2) Number of Students; 3) Number of Faculty Members (Teaching Staff) -- This criterion has a weight of one quarter that of the number of students; this favours departments and universities with large student/staff ratio; and 4) The Orientation and Character of the Departments -- The figures of budget allocation generated on the basis of the student and staff criteria mentioned above are adjusted by "correction factors" which correspond to specific types of departments. This adjustment affects the total allocation to each university to the extent that it has such departments. The "correction factors" are as follows: Technology and Computer Science Departments (2.0); Health Sciences Departments (1.8); Natural Sciences Departments (1.6); Physical Education and Athletics Departments (1.4); Fine Arts Departments (1.2). On the basis of the above criteria, each University gets a share of the total budget. Deviations are possible only after strong bargaining.

A portion of the Ministry funds coming into an institution is marked for teaching and research and is distributed internally to faculties, department and laboratories. The distribution criteria are rarely based on evaluation of results. Every faculty member is presumed to be doing adequate research and thus has a claim to research funds. Often, a simple division by the number of laboratories, or the number of courses taught, or the number of faculty members is the easy solution to the distribution problem.

Authors of textbooks or lecture notes approved for distribution to students get royalties which depend on the number of pages and the number of hours per week of the corresponding course. Any faculty member can propose for distribution his own book or lecture notes. Examinations are expected to be based on the contents of textbooks or notes approved for distribution.

The Special Research Funds. Any faculty member can do consulting or research for a public or private "customer" so long as it is done "within" the university. The university gets 10 per cent to 15 per cent of the total amount coming in. There is a Special Research Funds Committee which operates independently of the university or of the Public Auditor, essentially like a private consulting company with its own operating budget and staff. There seems to be no enforced upper limit on the amount earned by a staff member, per year, through such consulting or research activities. EEC research funds and Ministry of Industry, Research and Technology funds, which are allocated on a competitive basis (submission of proposals, evaluation by peers, etc) come into the university through the Special Research Funds Committee.

University Staffing. The Ministry of Education controls the number of faculty members and administration personnel in each university. There is an annual "personnel budget" which is also distributed to the universities on the basis of specific criteria. This budget is expressed in units of "faculty members" (for 1990, it is 1085 units). A unit corresponds to one faculty member (of any rank) or to two administrative personnel positions. The characterization of a "unit" is an internal matter for each University, but binding for the Ministry. The "personnel budget" is separated into two parts: the special and the general. The first part covers the needs of new departments. The second part covers all universities and has the general target of bringing the student/staff ratios of all universities to specific levels (e.g. Engineering: 20, Chemistry: 15, Medicine: 8, Law: 50, Theology: 50, Biology: 15). Each and every department in every University gets at least a minimum number of faculty members from the General Personnel Budget (for 1990, this minimum is 5). The distribution of the remaining units is based on the student/staff ratio.

THE USE OF PERFORMANCE INDICATORS, PEER REVIEWS AND EVALUATION CRITERIA

A large number of performance indicators or criteria are into laws and regulations. The main intentions of the criteria seem to be to control the authority and power of the full professors and to maintain the quality of the teaching staff at high levels. These indicators or criteria were introduced in 1982. Some of them seem to be working well, some not so well. Others have never been used. Some of these criteria are listed below. The list is not exhaustive.

I. Regarding promotion or election of faculty members (from lecturers up to full professors). There are specific numbers of years of experience and/or numbers of publications required for each rank. The length of time one can stay at each academic rank has a minimum and a maximum ("up or out" arrangement). These limits are: 2 to 4 years for the rank of Lecturer; 3 to 5 years for the rank of Assistant Professor; 3 to 6 years for the rank of Associate Professor.

II. Evaluation of Teaching. It is the responsibility of the students to evaluate each faculty member's teaching performance every semester. In this observer's opinion and to my knowledge, this has never been activated in an objective and systematic manner. No effective and organized teaching evaluation is taking place. The department chairman is supposed to keep a file of the publications of every faculty member -- and update it regularly. In my experience this, is rarely done.

III. Numerical Indices in Laws.

1. The members of the Special Research Funds Committee are designated by the DGA. One of the qualification criteria is the publication of at least four (4) papers in international journals over the last three (3) years. Another criterion is being active in research (publications, monographs, research grants, etc).

2. A qualification criterion for teaching graduate courses is documented research activity. This documentation includes publications in international refereed journals (a substantial number of the publications must be recent), citation by others, recent awards of research grants, and active participation in international conferences.

3. A faculty member is expected to be available at the university at least 25 hours per week. A faculty member can assume a public position (member of parliament, mayor, director of an organization, etc) without resigning from his university position.

4. The Rector or the Vice Rectors can be relieved of their teaching duties, if they so desire. A department chairman can have their teaching load reduced to a minimum of two (2) hours per week.

5. The number of faculty members who are on leave (sabbatical or other) from a department can not exceed one seventh (1/7) of the total number of faculty members in the department.

CONCLUDING REMARKS

This paper refers only to Greek universities. There are also the three-year polytechnics in Greece. Almost nothing of what is mentioned here applies to them. There also exist many research institutes, working closely with the universities in researh and teaching. Again, nothing about them is mentioned here.

Even though several numerical indicators are in use in Greek higher education, the social pressure for accountability remains low, almost non-existent. All indicators and evaluation criteria mentioned above are mainly for internal use (department or university). There exists no formally established mechanism for evaluating departments or universities. Where some indicators are used for inter-university comparisons (as mentioned above, mainly for funding), they work in favour of the newer or weaker institutions in at attempt to bring all universities at the same high level. It is the opinion of many academicians that the use of numerical indicators and criteria even as minimum requirements, have had an overall positive effect in Greece.

THE CONTEXT

There are two streams in Dutch higher education. Twenty (including seven theological) universities prepare students for independent scientific work in an academic or professional setting. The 87 HBO institutes concentrate on applied science, and provide their students with the knowledge and skills they will need for specific occupations. The Open University is a relative newcomer. It offers fully accredited university and HBO degree programmes, plus other courses, largely in the form of distance education.

Government - institution relationship

Although it is not its exclusive right, the government in The Netherlands is seen as having a duty to provide higher education. The cabinet proposes and parliament enacts laws on which the system is based, and the government allocates annual budgets to the universities and HBO institutes which account for about 90 per cent of their income. The government also sets the educational policy framework within which the universities and HBO institutes must operate. At the same time, however, there is a longstanding and highly valued tradition of academic freedom and institutional autonomy. The content of courses is never dictated from above.

In the way funding levels are determined, there is a significant difference between the universities and the HBO institutes. The total sum for all the universities together is fixed through negotiations between the finance ministry and the education ministry; the number of students is not the only factor that plays a role. For the HBO institutes, any change in the number of students is felt immediately in the sum granted to the sector as a whole.

The total sum for each of the two sectors is then divided among the institutions. In 1982 a new system for allocating funds to the universities was introduced. The ministry and universities agreed to a formula in which policy decisions could be reflected. This formula has multiple variables, some of which depend on student numbers and some of which do not.

Until 1986 the HBO institutes were financed according to a complex set of rules that dictated not only the amount an institute would receive, but also how the money should be spent. Since 1986 a new system of funding is in operation, with the following aims: 1) to harmonise with the system for the universities; 2) to establish a "normative" relationship between resources and responsibilities; 3) to improve the administration and management of the institutes; and 4) to get better value for money through mergers and the clustering of specialisations.

This is an exerpt of the statement prepared with contributions from a group of Ministry staff members and university professors including: M.J.G. Bormans; R. Brouwer; F.J.R.C. Dochy; O.C. mc Daniel; F.J.H. Mertens; C.M.M. Paardekooper; M.G.R. Seegers; A.A.J. Spee; H.S.S. Tseng; R.J. in't Veld; and W.H.F.W. Wijnen.

Government policy

Since the beginning of the eighties, the Dutch government has been trying to reduce its budget deficit by cutting public spending. The universities and HBO institutes have been among those to feel the effects of policies of austerity. Terms such as "efficiency", "rate of return" and "measurement of output" have acquired new meaning, and will continue to do so. Further adaptation will be required of the higher education sectors as a result of population changes. As in most industrialised countries, the number of elderly people will increase in proportion to the younger population. And in The Netherlands, women only now are entering the ranks of students and paid employees in significant numbers.

One of the main shifts in government policy towards higher education is the increasing demand for greater relevance to society. The government is trying, without infringing on traditional academic freedom, to encourage the universities to supply science and industry with the manpower they need, and to generate new knowledge and technology that can benefit the economy.

The HBO Education Act of 1986 legally placed the HBO institutes on the same level as the universities. They may be separate sectors, but together with the Open University they constitute a single system of higher education. The government envisages further integration in the future, as well as more forms of higher education offered on a flexible basis to people who have been out of school for some time.

The role played by the government in higher education, and its relationship with the universities and HBO institutes, is changing. At the same time that it is urging greater efficiency, the government is detaching itself further and further from any direct involvement in teaching, research and administration. It will be up to the institutions' own departments (vakgroepen and faculteiten) to develop systems for maintaining standards.

The study programmes at Dutch universities and HBO institutes have always been highly structured. All but a few programmes have a large proportion of required subjects in which examinations must be passed, although allowance must always be made for a prescribed number of elective subjects. It has not been easy to switch from one study programme to another, and transferring between universities and HBO institutes has been difficult. At the same time, however, students have had quite a bit of freedom to decide how they want to work through a study programme, and at what pace. Together with other factors, this has contributed to a high drop-out rate.

To correct these and other weaknesses in the system of higher education, a process of reform has begun by which the Dutch institutions will adopt certain features of the Anglo-Saxon system and combine them with strong points from the present Dutch system. The two education acts of 1986 (WWO and WHBO), for example, allow students a maximum of six years to complete a study programme. The government thinks there should be further measures to make the system of higher education more flexible, to offer the student more freedom to choose subjects, and to reduce the drop-out rates.

Budgets in the higher education sectors will remain under severe pressure, at least for the time being. Universities and HBO institutes will be expected to respond to ever-changing demands of both science and society while their resourses are shrinking. This means constantly weighing alternatives and setting priorities, which in turn calls for new instruments for assessment and decision-making.

The broad lines of government policy outlined above have been translated by the Ministry of Education and Science into more specific proposals. These are now in the form of a Bill known as the Higher Education and Research Act (Wet Hoger Onderwijs en Wetenschappelijk Onderzoek: WHW). The main proposals are the following.

- institutions receive a substantial greater autonomy regarding the design and implementation of new curricula. It is supposed to lead to innovative education-supply with great diversity in terms of course length, subject, pedagogical methods and quality.
- a system of intensive quality assessment will be introduced and will lead to public knowledge on the quality of teaching and research of the separate institutions. The existance of reliable quality judgements will enhance competition between institutions.
- the system of open access to all of the graduates from the higher forms of secondary education will be strengthened. Only in severe cases of capacity problems, the intake of students may be reduced by the institutions.
- in cases of imbalance of supply and demand of students, courses offered and positions on the labour market, government is allowed to centrally reduce the number of students in a certain discipline. The proposal for such a decision is intensively discussed and ultimately needs parliamentary approval.
- government remains the principle funder of the public higher education system. The present funding mechanism will be directed more towards output funding and will stimulate competition within the system.

The necessity of institutional evaluation

As far as The Netherlands setting is concerned, for quite a period systematic evaluation of the quality of education and research or, more in general, the performance did not belong to the managerial tradition of the institutions of higher education. A situation which is not surprising, if one bears in mind that we are talking about subsidized institutions where government grants add up to 90 per cent of the total income of these institutions.

The first consequence of this dominating government position is that government has become the focal point of institutional behaviour. Secondly, that efforts to evaluate the institutional performance are lacking if the government, being the focal point, does not provide compelling incentives to perform evaluation activities or if no significance is attached to evaluation results as far as they are presented by the institutions.

Systematic evaluation became an issue when the financial constraints and the increasing social demands on the higher system made it necessary to set priorities with regard to the activities performed. Until then, and we speak about the late seventies, distributive justice was the predominant principle in the allocation procedures of the government and the institutions.

A first step towards new developments was taken with the introduction of the so-called conditional funding of research in 1982: an attempt to introduce systematic quality control on the academic research activities.

In a government paper on the realignment of allocative and other administrative relations between government and higher education (HOAK, 1985), mechanisms for assigning accountability on all tasks have been established. Realignment of administrative relations implies that the policy instruments which the government employs, must give the institutions the necessary space for choice or room for manoeuvre: governmental control should be of a global nature ex post. The set of instruments currently employed is too much concerned with details and thus an obstacle to flexibility in the higher education system. This change in administrative relationships implies the need for evaluation, performed by the higher education institutions themselves, because the government, less involved in the internal affairs of institutions, wishes to keep a closer and more effective watch on the output and performance of the higher education system and to assess the institutions in the light of the systems' function in society.

As government sees things a lapse back into the situation regarding evaluation activities before the late seventies will not occur, because the consumers of institutional output (students, industry etc.) are established as a relevant referential framework for institutional management. This will be accomplished in two ways:

- the creation of a planning system in which institutions and government in an iterative process express their opinions on future developments in the environment of the higher education system and derive social desiderata from them;
- the influence of consumers on the higher education system will be increased on the basis of the expectation that market-dynamics will have a positive impact on the quality and relevance of the tasks being performed; students, firms and other labour market partners are relevant consumer groups. One of the consequences of this policy will be that the resources gradually will consist of a mixture of government grants and market oriented funding.

In a non-profit environment such an approach can be compared with the evaluation function for the management of profit organizations. The institutions should be alert to market-dynamics for their proper functioning. In this way the market is constantly present as a referential framework for evaluation activities.

Because of the fact that government is ultimately politically responsible for the functioning of the higher education system, the ex post exercized governmental control should enable judgments about the developments to take place. The government can only perform this task if methods and results of evaluation make it possible to a large extent to compare the performance of the different institutions.

That is why, apart from general insight into the performance of the system, performance indicators form an important part of the tools to implement the proposed alignment of administrative relationships.

THE EXPERIENCE IN THE NETHERLANDS TO DATE WITH PERFORMANCE INDICATORS

The subject of performance indicators has been of interest to both academics and administrators for some time. More progress seems to have been made in developing and applying indicators for academic research than for education in general.

"Scientometric" or "bibliometric" indicators, for example, have been developed for research, based on publications and citations. Cluster analysis, which takes citation analysis one step further, has been developed and applied to research in The Netherlands.

Some experience has also been gained with the application of these indicators on the administrative side. Indicators are rarely used as direct input for reaching decisions on resource allocation, but are occasionally used by advisory bodies such as the fact-finding committees set up on an ad hoc basis by the Minister of Education and Science to examine specific fields (e.g. Biochemistry, Physics, Economics, Philosophy and, recently Theology) and partly on this basis, to develop a future scenario and policy outlook. Another body which should be mentioned here is the Science Policy Advisory Council which advises the Minister, either on his request or on its own initiative, on science policy in both the national and international context. The Council has, for example, used indicators on the quality of research in its recommendations on medical sciences.

The development of performance indicators for education is still in its infancy. Indicators are often not used empirically but established a priori, in a normative way. An example may make this point clear. Funds for university and higher vocational education are distributed on the basis of the student utilisation model. A strategic variable in this model, and one which can be empirically ascertained, is the number of students enrolled in courses. This figure is then adjusted in various ways, for example to take account of the target number of graduates or the specific student/staff ratio desired, both of which are fixed by the government on the basis of normative considerations. So the number of graduates is an exogenous variable in resource allocation. Another such variable is the number of dissertations per university.

Data on the state of the labour market for graduates have been used to support proposals for savings in the recent policy proposals on financial growth and cuts in universities and teaching hospitals.

The role of performance indicators in planning

Performance indicators (PI) are considered to be of great importance in the dialogue between the government and the institutions. It has already been indicated that PI, generally speaking, can stimulate a dialogue that is concise and fruitful because PI can back statements with the relevant facts. The realignment of administrative relations between government and the institutions has been characterized as allowing the institution the necessary room to manoeuvre. A greater scope for policy-making by the institutions themselves enables them to make strategic choices, to choose the most appropriate elements of their mission. It is assumed that in this way the performance will be optimized and more in accordance with the needs of society.

Seen from a governmental perspective, a greater scope for policy-making by the institutions implies a greater need for dialogue. The Dutch government did lower its pretentions about its ability to steer the higher education system with the present set of instruments, but dit not give up its goals. The dialogue is thought to be of such importance that a new kind of planning is being developed, which reflects the concept of dialogue.

We are talking about the Higher Education and Research Plan (HERP), a biannual plan which the government published in September 1987 for the first time. The plan is published for the following reasons:

- the government wants to increase the consistency in the policy-making;
- the government wants to bring about a dialogue that is rational and backed by relevant facts, analyses and public statements; the statements we are talking about are those made by authoritative persons of relevant organisations, inside or outside the higher education system;
- the government wants to stimulate the institutions to anticipate future challenges and make strategic choices.

The government wants to be more convincing in its policy-making but less compelling. That is why in HERP much attention has been paid to analysis; analysis of the environment of the higher education system in order to be able to deduce social desiderata. The institutions are invited to indicate in their plans the validity of the analysis and, more important, the relevance as a referential frame work for their institutional management. HERP also presents an analysis of the performance of the institutions, using as a frame of reference missions or goals made explicit by the institutions themselves.

Particularly in this kind of analysis performance indicators will be used for two connected reasons. First of all the analysis will be more valid. Secondly, the impact of the analysis in the dialogue will increase. If we are able to develop a set of meaningful indicators it will be possible to make a profile of an institution, based on facts. This actual profile can be used to indicate the position of the institution in the whole system and, more important, to check the profile (mission or goals) propagandized by the institution.

The government presents its findings in HERP and invites the institutions to react in their plans. The dialogue we are talking about is a dialogue between the institutions and the government, mutually reacting in their own plans to the others. But there will also be real consultations in which findings are discussed; the so-called bilateral consultations. The government wants in-depth discussions with each institution about its mission and performance, for the same reasons as stated before when discussing the HERP. The government wants to stimulate the institutions to anticipate future challenges, to make their mission explicit and to make strategic choices.

Although we have been stressing the importance of performance indicators, it should be clear that in the dialogue there should also be room for qualitative reasoning. It has already been pointed out that it will probably not be possible to find valid indicators for all the aspects we would like to indicate. However, we also expect that performance indicators will not only make the dialogue more to the point, but will also provide an incentive to make the qualitative reasoning more precise, because the qualitative reasoning has to compete with supposedly objective facts, which seem to be <u>a priori</u> convincing.

It is important that with HERP not only performance indicators, analyses and conclusions have been published, but also their empirical basis. The partners involved in the dialogue should be optimally equipped to draw their own conclusions and to check the others'.

OPERATING CHARACTERISTICS OF THE QUALITY CONTROL SYSTEM IN WHICH PERFORMANCE INDICATORS MAY BE USED

In April 1986 the following principles were formulated after consultation between the Minister of Education and Science and the higher education institutions as a basis for the development of a system of quality control for higher education.

- The higher education institutionts are responsible for monitoring standards by means of evaluation. They will do this by means of internal evaluation on the one hand and on the other by allowing periodic external checks on quality.
- The Minister of Education and Science is responsible for evaluating higher education. In implementing the evaluation duties arising from this responsibility, the Minister will as far as possible take account of evaluation by the higher education institutions.
- The universities will jointly draw up a forward-looking evaluation plan which will be discussed in the Higher Education Consultative Chamber.
- On the basis of the institutions' evaluation plan, the Minister will draw up an evaluation plan setting out the proposed activities of the institutions together with criteria, procedures and findings. The Minister will assess the methods of quality control used by the institutions and the procedures followed (assessment at meta-level). The inspectorate may itself "fill in the gaps" by assessing the quality of those disciplines which are not assessed by the institutions themselves.
- Development of and discussions on "performance indicators" will be intensified. Indicators are meant as a method to determine the quality of educational institutions by means of a limited number of standards. Research in performance indicators will be executed, as fas as possible, by the ministry, the institutions and the inspectorate together. The research will concentrate on "practicable" indicators.

The responsibilities of the higher education institutions and the Minister of Education and Science are thus complementary.

Quality control by the institutions implies in the first place self-evaluation by the faculties. In a guide produced by the VSNU to help faculties prepare for a visit from the review committees, self-evaluation is described as follows:

- a systematic analysis of how a faculty or part of a faculty operates, describing the existing situation, strenghts, problems and plans for the future;
- part of a continuous process of concern for internal quality;
- a stimulus for internal discussion about quality which can lead to the decision to take independent measures to improve standards;
- the synthesis of faculties' educational reports and development plans.

Self-evaluation is not therefore a new activity. It serves to systematise what is being done (or what should have been done) and to put judgements about quality into a conveyable form.

In the second place quality control necessitates comparison between faculties. This comparison is made by visiting review committees composed of fellow academics (preferably not members of the faculties to be inspected but professors emeritus or scholars from abroad, for instance) and representatives of the "market" and professional organisations. The composition of the review committees qualifies them to make an adequate assessment of quality from both an academic and a social viewpoint. The committees study the basic data and self-evaluation of the faculties at the various higher education institutions and then visit the faculties. Their findings are presented to the executive board of the institution concerned. An overall report is drawn up for each discipline, which is made public, while a confidential report is sent to each faculty. Inter-faculty comparison is not an entirely new idea, but it was previously limited to comparisons of staff (publications, citations, etc.).

The third element of quality control by the institutions themselves is that the latter must respond in an appropriate way to the findings of the review committee. The institutions are expected to indicate in their development plans what they intend to do about the committee's findings. This may mean that education of a high standard is further improved or that more is invested in poor education to raise standards. Another possibility is that teaching of a poor standard is dropped completely. The executive board can derive justification for its actions from the findings of a review committee: if faced with the threat of sanctions by the Ministry of Education and Science it can take measures which would otherwise have been impossible to take.

The first, albeit experimental, national and interdisciplinary review committees started in 1988. In 1993 all university sectors will have been reviewed.

HBO institutes decided, in the first instance, on an institutional approach rather than a sectoral one. The establishments have started a programme for the year 1988 and 1989, consisting of a small number of experiments, that aims to achieve better understanding of methodology and procedures best suited to monitor the quality of teaching. The results will be used in a sectoral program, to be discussed early 1990 in the Higher Education Chamber. Implementations will start in 1990, according to a time table to be decided.

Quality control in academic research

Research at Dutch universities is funded from various sources. The first possibility is that funds are obtained directly from the Ministry of Education and Science. This is known as the first flow of funds and accounts for around 65 per cent of all university research funding. Secondly, funds from the Ministry may be allocated to the universities by the Netherlands Organisation for Scientific Research (NWO). This is the second flow of funds and accounts for 15 per cent of research resources. The third and last flow of funds derives from contract research for industry and government bodies. This accounts for approximately 20 per cent of university research funds.

1982 was the first year in which a distinction was made between the funding of education and that of research in the funding formula for the first flow of funds. After a transitional period, the bulk of the research funded from the first flow of funds (over 60 per cent) was assessed on the basis of criteria relating to academic quality and relevance. This was the start of conditional funding (VF). Research programmes were funded by the government on the condition that they were guaranteed by the institution concerned, were favourably assessed, were on an acceptable scale and would run for about five years.

In 1982 the Minister of Education and Science formulated the following objectives for research policy, which were intended to steer the development of the conditional funding system in the right direction.

- The new structure for the funding of research is independent of the number of students; what matters is academic quality and significance, and social relevance.
- By presenting its research in programmes which were cohesive and on a suitable scale, the institution will fulfil its responsibility to the body providing the funds.
- Research work funded under the new system will be assessed externally. Committees comprising Dutch and foreign experts will assess the quality and significance of programme proposals by means of a previously agreed assessment procedure. It should be possible on the basis of their findings, if necessary, to reallocate research resources within, but also among, universities.

The most complicated part of VF is the external assessment, about which there was initially considerable confusion. Responsibility for appointing the assessment committees was placed in the hands of a number of well-known organisations such as the KNAW and the NWO. The criteria by which the committees had to assess research programmes were:

- academic quality and significance;
- social relevance;
- minimum size of five full-time equivalents;
- minimum duration of five years;
- the internal cohesiveness of the programme.

Over the years the focus of discussion in policy debates about conditional funding shifted from assessment to the reallocation of resources. The benefits of reallocating resources between universities as a reflection of differences in quality and relevance were on the whole accepted, providing such decisions were taken with the utmost care. There was in fact no reallocation of funds until 1986.

In 1986 the first round of conditional funding came to an end, the available budget having been fully allocated to approved research proposals. In January 1987, when the second round started, four important changes had been made to the system. These changes had been agreed upon by the organisation concerned in an ongoing process of discussion.

- From ex ante to ex post assessment
  Now that the universities had more than enough approved programmes already under way, there was no longer any need to assess programmes in advance. From now on the universities were to assess approved and guaranteed programmes ex post. The chief factor here was the extent to which research results satisfied the criteria of quality and relevance.
- Assessment per discipline
  In the first round of conditional funding it had been possible to submit programmes in any discipline for assessment each year. This complicated the job of comparing programmes in any one discipline. Since 1987, therefore, proposals have been assessed per discipline. In other words all programmes in the same discipline are assessed ex post in the same year.
- Reduction in the number of assessment committees
  A varied collection of assessment bodies had emerged, ranging from ad hoc committees to the committees appointed by the KNAW, the ZWO (the old name for the NWO), professional organisations and the like. Since 1987 only the KNAW, the ZWO/NWO and the Royal Institute of Engineers have been authorised to appoint assessment committees.
- More precise stipulation of responsibilities
  A more precise line was drawn between the responsibilities of the Minister and those of the universities. The primary responsibility now lies with the universities jointly. The Minister is politically accountable for the VF system and accordingly seeks guarantees for the independence of the assessments. The Minister is also responsible for any reallocation of resources among the universities which may prove to be necessary as a result of the assessment findings.

An important consequence of this redefinition of responsibilities is that the Minister no longer guarantees individual programmes. Since 1987 he instead guarantees the overall VF budget of a university. The university must in turn undertake to spend its VF budget on the programmes which it has guaranteed.

Early 1990 the results of the second round will be discussed, and a plan for the third round (1992-1994) will be decided next.

The role of the government

The results in the years to come will be the decisive factor in determining whether the government will assume an active role in quality control. Even if it is only by way of contra-expertise, the government is at liberty to form its own boards of inspectors, the threat of which acts as an inducement to the establishments to keep their systems in good order and not to ignore the results. The government's role in the process of monitoring standards is above all a complementary one.

One implication of this is that the performance of the establishments must be made visible. It is thought that performance indicators can play an important role here if they are meaningful and acceptable to both parties. That is why the government has been stressing the necessity of a dialogue about choice, form and method of application. An agreement in principle on this matter has been reached with the establisments but there is still much scepticism because of difficulties being encountered while trying to identify relevant and meaningful indicators.

In the Higher Education and Research Plan 1988 a tentative list of education indicators was published. The method used in HERP for collecting this information was two-fold.

- Firstly an analysis of the functioning of each of the institutions separately. For political reasons this analysis was not included in HERP itself but sent to each institution separately.
- Secondly an analysis of the functioning of all institutions by means of performance indicators.

By means of these analyses the government wanted to obtain objective information on the basis of which a fruitful dialogue between government and institutions could take place. The analyses give the Minister of Science and Education means to compare the functioning and performance of the institutions.

The information about performance was collected from computerized data bases of the Ministry of Education and Science itself. The analysis on basis of performance indicators was only made for the universities. This is because extended data bases were available only for the 13 general universities and because the university system is rather simple. The PI were developed, by means of induction, for education (teaching and program), research and personnel. To execute the quantative analysis a matrix of 26 indicators was developed. For each of the 26 indicators a ranking order (varying from 1 to 13) between the universities was set-up: an analysis which covers relative differences between universities. The analysis takes only into account - as far as time series were available - changes per institution in their relative position compared to the other universities.

The first set of indicators was:

a. Increase in number of students, that enroll for the first time at a university between 1980 and 1985.
b. Ratio of gross number enrolled student to first year students in 1986.
c. Median graduation proportion of the first year students cohort after three years.
d. Change in median graduation proportion before and after the legislation of the curriculum reform (a higher increase gives a high ranking number).
e. Change in total efficiency before and after curriculum reform.
f. Change in academic staff funded by research agencies between 1980-1985.
g. Change in academic staff funded by contract research 1980-1985.
h. Change in academic staff funded by research agencies relative to total amount of academic staff.
i. Change of academic staff funded by contract research relative to total academic staff.
j. Allocation of Huygens-fellows 1985 and Royal Netherlands Academy-fellows 1988 (= measure of research-quality in terms of special funding).
k. Increase in research production 1980-1985.
l. Increase in dissertations in 1980-1985.
m. Six-year average in dissertations per 100 members of the academic staff.
n. Dissertations relative to total membership of the academic staff 1985.

o. Six-year average of research products of total academic staff 1980-1985.
p. Total research work relative to total academic staff.
q. The percentage of the conditional financed research which is assessed externally.
r. Change in the total amount of women relative to the total acadeamic staff 1983-1986.
s. Change in the total amount of women relative tot the total non-academic staff 1983-1986.
t. Percentage of female academic staff 1986.
u. Percentage of female non-academic staff 1986.
v. Rejuvenation of academic staff.
w. Average age of academic staff 1986.
x. Change in average age of academic staff 1983-1986.
y. Average age non-academic staff 1986.
z. Change in the share of temporary personnel (an increase gives a high score).

The Minister of Education and Science did publish some reservations about validity and usefulness of the indicators presented in the matrix. Reason for this is the inductive way in which the indicators were developed. The purpose of presenting this matrix was to stimulate discussion instead of making a quantative judgement about each university separately.

The publication of these indicators and a matrix in which they were used did lead to many reactions and clearly indicate improvements needed in and for further development of performance indicators in the higher education system:

- There is further need for making explicit the purposes of the indicators: what does the indicator intend to measure and what are the intentions behind its use?
  In fact this is a plea for a deductive way of developing indicators. This way of developing indicators has a clear disadvantage, because in this way it takes a very long time before performance indicators are developed, because the whole path of objectives, operationalization, indicators, variables, data bases has to be passed through. A combina tion of both the inductive and the deductive way will probably produce the most useful PI.
- Indicators based on changes in fact give bad reflections of institutions with good early performance. This criticism is appropriate. However, such indicators need not necessarily hamper institutions, because measures taken by the government on the basis of PI will never be based on just one indicator but on the mix of all the indicators.
- Much of the reactions focussed on the specific rankings.
- Presenting this kind of measuring of performances of institutions could put a stop to needed discussion. It may be the perception of the institutions that the Minister has all the information needed, so that institutions can take a passive attitude, instead of participating in the discussion.

In 1988, the Minister of Education and Science initiated a working group on performance indicators in which the ministry, the inspectorate, the universities and the HBO institutes participate. This group was asked to agree on the selection of useful indicators. The selection procedure may be described as a process of searching for a common language, in order to translate the abstract goals into concrete matters. Moreover, a Research Group of the University of Limburg was asked to evaluate the validity and reliability of possible performance indica tors. The initial group of indicators recommended on The Research Group is printed in Appendix C.

Since initial consensus is reached on these indicators, reactions are being gathered and this proposal will be discus sed on a conference in spring 1990.

Possible science indicators

The central issue of a pilot study on science indicators was the examination of the potentialities of quantitative, literature-based (i.e. bibliometric) indicators as tools for university research-policy. The study was initiated by the necessity for a large-scale project-evaluation resulting from a drastic change of the allocation-system at the State University of Leiden. As a subject of extensive investigation the research performance of two large faculties of the State University of Leiden (Faculty of Medicine and the Faculty of Mathematics and Natural Sciences) was analysed for the period 1970- 1980. Unit of analysis was the university research group.

Two important aspects of research performance are output and impact. Output refers to the extent to which research creates a body of scientific results. Impact is defined as the actual influence of research output on surrounding research activities. A distinction is made between "quality" and "impact". It is assumed that publications must have a certain basic quality in order to generate impact. However, other factors can determine impact as well, factors like "citation-behaviour", publication-characteristics and data-source characteristics. These factors differ considerably for the different research fields and change in time. Impact is a relevant aspect of research performance, since from a research policy viewpoint one should not only require researchers to produce scientific results of some scientific quality, but also to have them make their results known to colleagues.

The output indicators used in this study are essentially based on the number of publications within the international scientific literature. Impact indicators were constructed on the basis of the number of times these publications were cited during a certain period by other articles published in the international scientific literature. These quantative impact indicators were calculated for all research groups in both Faculties.

The usefulness of science indicators depends upon
- the way they are used by the different levels of management
- acceptance of indicators and the presuppositions they are based on.

In the Leiden-project the bibliometric methods may be used differently by three levels of university-management.

- By the Governing Board as as aid for marginally checking the faculty proposals for the Z-status (Z-status meaning conditionally financed research, not related to teaching and granted for quality reasons).
- By the Faculty Research Board as an aid for assessing the quality and therefore the "Z-potential" of the research project.
- as an aid for the research management, for instance at the departmental research group or research institutional level.

In compliance with the wishes of the Board of Governors a working method was chosen, that included ample consultation beforehand with the faculties involved (Faculty of Medicine and Faculty of Mathematics and Natural Sciences). From these consultations the agreements were derived on the procedures and the form of the bibliometric data.

The working method agreed upon with the faculties resulted in a test of the use of bibliometric indicators for the faculty assessment of the Z-potential of the research project. A second result of the working method was a remarkable variation in the consequences for the different faculties. In the rather centralised Faculty of Medicine the Chairman of the Board played a vital role. In the strongly segmented Faculty of Mathematics and Natural Sciences the use of bibliometric data depended on the degree of acceptance by the research groups.

Further development of the method and sharing of experience are necessary. It is therefore important to up-date the bibliometric data and to apply the method to other universities. Further thoughts have to be developed on the relevance of the applied criteria for selection of the publication and citation data. This may not under any circumstances be decided upon by the "policy-makers".

IN CONCLUSION

The results of quality assessment procedures in The Netherlands in the years to come will be the decisive factor in determining whether the government will assume an active role in quality control. One implication of this is that the performance of the institutions must be made visible. It is thought that performance indicators can play an important role here if they are meaningful and acceptable to the government and the institutions. Two sets of possible performance indicators were proposed. A first set was published in the first Higher Education and Research Plan (HERP, 1987). This set encountered a lot of criticism and therefore it was not implemented. A second set is based on the outcomes of research done by the University of Limburg, and will be discussed on a conference in spring 1990.

Research on possible science indicators is being done by the University of Leiden. Indicators based on cluster analysis and co-word analysis may be available, on an experimental basis, by the end of 1990.

We have learned that thinking about performance indicators cannot take place in isolation: performance indicators and their use should be discussed simultaneously. Embedded in a communication in which "irrational" factors such as intuition, power and authority play a role. In The Netherlands, the debate on indicators achieves a depth and relevance as soon as the exploratory and review committees stop using "objective" yardsticks. We should pay attention to the inevitable implications of pluralism: what conditions are required to make it constructive? In administrative terms, attention then will be devoted to the rules of the game.

THE CONTEXT

Nature of Higher Education System

Higher education in Norway is highly decentralized, consisting of approximately 200 public and private institutions, of which only 10 (including the four universities) have more than 1000 students each. The system consists primarily of the 4 universities and of a large number of mostly small sized regional colleges operating under 17 regional boards. A few more specialized institutions also have university status. The other colleges mostly offer education of shorter duration, normally two to three years, although a few have the right to grant degrees in specific fields. A few colleges of art and performing arts with a nationwide responsibility may be said to belong to the non-university sector, but without being administered under the regional boards.

Both the universities and the more specialized colleges with university status offer professional degrees. Degrees offered in Norway may vary from one university to the next. The basic degree structure consists of the following. A lower degree generally taking about four years, comprised of 2-3 subject fields (Cand. mag.). A higher level degree, which is taken on top of the lower level degree, generally taking about two years of specialized study within one subject field. Regional colleges may also be entitled to grant the lower level degree and even the higher level degree usually in fields which are not covered by the universities. The universities and the colleges of similar status have the responsibility for education at doctor's level granting degrees at a Ph. D. level, but also grant a doctor's degree within an individually organized study (Doctor philos.). Norwegian universities do not (with a few exceptions made for foreign students) offer Anglo-American Bachelor of Arts, Bachelor of Science, Master of Arts, Master of Science or Ph. D. degrees.

Massification of Higher Education and Access Policy

By 1989 the total student number was approximately 112 000. The objective of Government policy had been, however, a capacity of 105 000 student places by the mid-90's. This proposal was put forward in a long-term programme presented to Parliament in spring 1989. The vast increase in student numbers was caused by the lack of quantitative regulations of access at some faculties in the universities.

The normal requirement for access to higher education is completion of one of the 3-year theoretical programmes at the upper secondary level. In 1987 about 31 500 satisfied this criterion, a figure corresponding to 46 per cent of the 19 year-olds. Not all of the 31 500 passed their examination which

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means that the figure of potential new students from upper secondary school is somewhat smaller. The transfer frequency directly from upper secondary education, the theoretical area of study, to higher education dropped from 26 per cent in 1974 to 16 per cent in 1981 but has increased since then to 22 per cent in 1984 and 23 per cent in 1987. The figures are not quite comparable because of the upgrading of a number of institutions to higher education status, but the tendency is clear. Calculations of the cumulative transfer frequency a number of years after secondary completion, show a similar tendency.

Institutional differentiation: universities and non-universities.

Although not as clearly marked as in many other countries, there is a dividing line in Norway between the university sector and the system of regional colleges. The four full universities and other institutions with university status cover most of the traditional fields of study, although there is some tendency towards specialization. These institutions primarily look upon themselves as institutions which should cover nationwide interests. Research is mainly concentrated in the universities and other university level institutions.

The members of the university boards represent the staff and students of the particular institution. The rector is elected by representatives of the scientific, administrative and technical personnel and the students. In all governing boards in the university sector the majority of the representatives are elected among the scientific personnel. In the non-university sector some of the institutions have an elected rector and a managing director, others have a rector appointed by the Ministry, the rector is then also the administrative leader. Those regional colleges which are not professional colleges, have normally an elected rector, while the system in the professional colleges is varied. In these institutions there seems to be a development towards appointed rectors with a tenure of 6 years, as opposed to elected rectors. The development in this direction is, however, not quite clear.

The seventeen regional boards for public regional colleges have normally 9 members and are composed of representatives proposed by the county council, the personnel and the students of the institutions. The county representatives form the majority of the boards. The boards have chosen to organize their work in accordance with the situation in their region. Thus, regional politicians have gained more interest in educational issues and this has led to valuable co-operation between regional enterprises, organizations and institutions of higher education. The boards have also been instrumental in the establishment of regional research foundations.

Initially, research was not planned as a main activity within the regional system of colleges. Gradually, however, many institutions and especially some of the larger regional colleges have developed quite substantial research activities, often connected to specific regional problems.

Government-institution relationships

It is an objective for the Norwegian Goverment to change the way of governing from the use of detailed regulations to a system of governing through setting up objectives for the different public sectors and expecting certain results. This change is followed by an expectation that all State institutions use a system of planning for a short-term (the budget year) and a middle range term (3-4 years or more). All State institutions must also formulate their objectives in dialogue with the responsible Ministry and establish a system for following up their results. The establishment of a system like this is in its very beginning in the higher education sector.

Institutional autonomy is greater in the university sector than in the sector of regional colleges and other public colleges. A new law regulating the responsibilities of the universities and the colleges with university status is effective from January 1990. The new law states that the institutions may have a board of either 9 or 13 members, and that the deans or other representatives of other subordinate formal units may not be members of the governing board. This is to secure a board which takes responsibility for the institution as a whole instead of a board where the members act as representatives of the single faculties. The law secures a widespread delegation of power from the Ministry to the institutions, such as the right to appoint professors as well as the managing director. The law stipulates the responsibilities of the rector and the director respectively. The right to decide which subjects the institutions shall be able to take up, and which degrees or certificates the institution is entitled to grant remains in the Ministry, whereas the right to give any further details about content and plans for the study, and detailed instructions on entrance requirements is given to the institutions. The institutional right to decide the content of education and research is granted in the law.

In the regional sector, the Ministry appoints the managing director in the institutions which have an elected rector and in the other institutions the rector is appointed by the Ministry. As already mentioned, external representatives form the majority of the regional boards. Regulations of entrance requirements and examinations are given by the Ministry. The number of students, which subjects the institutions shall be allowed to take up, and which degrees or certificates the institution is entitled to grant is also decided by the Ministry. For the professional colleges even a framework for the plans of study is decided upon in the Ministry.

Funding of Higher Education: patterns and policies

The state finances practically all of higher education in Norway. The total funds to be granted directly by the state are determined by Parliament as part of the annual budget. In addition, about 10 per cent of institutional expenditure is covered by external sources, through contract research and research foundations.

Private institutions of higher education have a considerable proportion of their running costs covered by public funds. Their grants amount to about 5 per cent of the public budget for higher education. Students in these institutions, some 10 per cent of the total student population, have the same rights to state grants and loans as those studying at public institutions, i.e. when private college programmes are considered equivalent to those within public higher education.

To all intents and purposes, higher education in Norway is free. The students pay only a minimal fee which is used for welfare activities carried out by their own organizations.

According to the Government's budget proposal for 1990, the total budget for higher education institutions will increase by 20 per cent from 1989 to 1990. The budget increase is mainly due to a 73 per cent increase in capital investment, particularly in new buildings. The institutions have not been given a full compensation of the expenses linked to the unusually high increase in the number of students. The expenses per student have decreased 9.2 per cent in the university sector from 1979 to 1987 and 5.9 per cent in the regional sector in the same period.

In the ordinary budget for higher education institutions, funding for teaching and research is not separated. Usually additional funding must be obtained from research councils which allocate money according to judgement on research quality.

Government views on institutional mission

Norwegian planning of higher education is intended to meet the needs of the labour market, as well as individuals' interest to seek knowledge and competence through the higher education system. Our experience is that except for some of the professionally oriented studies, there has been no clear link between prognostics of future needs and educational planning. A well-educated labour-force is none the less seen as an important productive force. Knowledge is supposed to be of even higher importance in the time to come and this will also have concequences for the adult learner and continuing education.

In the past years, the governmental aim has mainly been to increase the number of students, especially in the fields of economy, technology, health education and pre-school teachers. Education for the adult learner, under the slogan, "life-long learning", although an area of priority, seems to have become lost somewhat in the competition with young persons wanting higher education. This area is expected to be given increased weight as the demography changes towards smaller numbers of young people. Also, training of young researchers has been an area of priority.

The time has now come for consolidation. No new institutions of higher education are to be established, and there is a need for merging of existing institutions. The quality of the existing teaching programmes is under discussion, as is also the reason for rather dismal examination results, the question of drop outs and the slow progression of students through the education system. In the public debate these questions are usually linked to the discussion about aid to students. The student aid is based on grants and loans.

At the national level, this evolution is in its very beginning. The need for development of performance indicators and institutional evaluation is linked to the changes in the management of higher education institutions. Increased self governance in financial as well as other matters has forwarded a discussion of how to create a national policy of higher education in a decentralized system. How will central government allocate resources to the institutions based on a system of allocation of lump sums instead of giving detailed instructions on how to use the money? Also the institutions themselves have questioned the legitimacy of the Ministry's allocation of resources and asked whether they are based on historical differences or on real needs. In Norway we hardly foresee a system of resource allocation strictly related to certain key figures such as student numbers, passed examinations and published research results, but we do hope to establish a more transparent system of resource allocation. And we hope to establish a system helping us to pose better questions related to productivity as well as quality.

It is important to bear in mind that Norway is a scarcely populated country of 324 000 km2 and only 4.2 million people. The length of the country is about 2500 km from the south to the north. If education shall be granted in all parts of the country, differences between the institutions will by necessity be considerable.

A higher education system ruled partly by a lot of decisions taken in the Ministry, secures for the Ministry information about the institutions, even though the information might be fragmentary. A self-governing system deprives the Ministry of this kind of information. A movement toward the latter accentuates the need to seek alternative information. Motives for a new orientation in the Ministry may be said to be a need for information, as well as assessment of productivity and quality. I will mention some strategies which are used in ministerial work.

Preliminary work is being done on the requirements to establish a data-base on higher education statistics. To make this to an instrument of management, the developmental work is being done with close contact between the Ministry and higher education institutions. A decision of whether or not to establish such a data base will be taken in spring 1990.

Institutions in the university sector have established a working group to develop a set of parameters to compare institutionals resources and results. This is being done in close contact with the Ministry and the institute that works with the already mentioned data-base. At the institutional level the situation is manysided. Only one institution, the University of Bergen, participated in the IMHE project on performance indicators in higher education. The IMHE list of indicators is, however, being considered by the group already mentioned

To stimulate institutional evaluation, the Ministry has recently set down a working-group with a mandate to discuss how to improve courses of study, teaching and learning. The group will also discuss how to implement the ideas. The intention is to create a qualitatively better result for the students as well as a faster progression of students through their studies.

As another strategy the Government has proposed 3 million NOK in the 1990 budget to be spent on research related to higher education.

Guidelines for the new system of institutional planning is another instrument in governmental reorientation. All institutions of higher education are now implementing the new system of short-time and medium range planning. Since, the planning system includes establishment of a system to follow up results, there is a widespread activity to find measures for what is quantitatively measureable, but also to find systematic ways to report results that must be qualitatively described.

Some institutions both in the university and the non university sector have programs where students evaluate their lecturers. A longer tradition relates to peer-review evaluations of the resarch at a university or other research institution. Finally, there is continuing evaluation performed in higher education institutions related to student examinations, doctoral programs, employment of personnel and applications for research funding. In these evaluations external evaluators play a prominent part.

The probable operating characteristics of the system.

While there is no established system of performance indicators in Norway, one case say a few things about likely operating dimensions. Interinstitutional comparisons are hardly even used in Norway. The same is to be said about rankings of institutions.

The university sector working group has issued a preliminary report on their work. One of the outspoken aims of this project is to see if it is possible to establish a system which is more transparent than the existing system and thereby also facilitate interinstitutional comparisons when it comes to allocation of resources. Results of education are defined as numbers of passed exams in equivalents of a one year programme, this compared to full-time students. Results of research are defined as research projects and publications, so one might say that research is not proposed to be measured, but the results of research are to be followed up.

Issues in the development of performance indicators/institutional review.

A closer review of institutional performance will probably be a result of the changes in the system of governance of higher education. Whether Central Government will have a role in the assessment or only "assess the assessment" is not decided yet. Which role performance indicators will play in the assessment is also unknown. Some work on this topic is being performed in some of the higher education institutions, whereas the Ministry has concentrated on ways of improving information about higher education, specially related to statistics. How this information will be used and how resource allocations will be affected is still to be seen. Of special interest to us is therefore knowledge about the experiences from use of performance indicators compared to experiences with other more "open" systems of institutional evaluation.

THE CONTEXT

The Nature of the Higher Education System

Since the higher education reform of 1977, Swedish higher education has formally consisted of an integrated system which includes not only traditional university studies but also those of various former professional colleges, as well as a number of study programmes previously offered by the secondary school system. Two main ideas w ere fundamental to the policy of a single comprehensive system of post-secondary education: the urge to reduce differences in status between different types of post-secondary education and the strong requirements, at that time, of rational planning. With the exception of the University of Agricultural Sciences, all institutions of higher education in Sweden come under the jurisdiction of the Ministry of Education and Cultural Affairs. The National Board of Universities and Colleges is the central government authority responsible for higher education and research.

Undergraduate training is available in the form of general, local or individual study programmes, supplementary study programmes or separate courses. General study programmes are intended to meet more permanent educational needs and are directed towards a wide range of professions (e.g. the training of physicians, economists, lawyers etc.). Local study programmes are offered mainly on the basis of special needs in the area or region. Individual study programmes may be arranged for individual students or groups of students. Specialised continuation courses are offered after the completion of general study programmes (e.g. the further training of nurses). Separate courses are intended to meet needs of education outside the programmes, specially in further education.

The six universities and the 30 or so university institutes and university colleges in the comprehensive system thus offer essentially the same types of study programmes and separate courses, ranging from the largest universities with their full range of faculties and programmes to the smallest regional university college with only a small set of study programmes within one or two faculties. Only the universities and the university institutes of technology and medicine have a permanent research organisation and post-graduate programmes for doctoral studies.

The highest body of the higher education institutions is the governing board, which consists of the rector or vice chancellor (chariman), representatives of public interests, representatives of the institution's activities and representatives of the students. Since 1988, as part of the process of decentralisation, the external representatives of the board constitute the majority, at the same time as the board's responsibilities for the institution have been widened.

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Massification of higher education and access policy

In Sweden as in most other countries, student numbers grew very rapidly in the decades following the Second World War. Net first-time enrolments for higher education in 1945 totalled 2,650. Twelve years later the figure was more than double. Numbers then doubled again in six years, with 11,800 first-time enrolments in 1963, rising to more than 30,000 in 1968, the peak year. This heavy expansion of education was followed, first by a decline and then by a certain recovery.

The 1977 higher education reform, which had the effect of integrating practically all post-secondary education with the higher education system, also included a central admissions system, and after a few years the total volume of all study programmes came to be specified by the Riksdag (Parliament). Since then the number of first-time enrolments has remained practically constant, at the same time as there have been variations in the distribution of student numbers between study programmes within these total frames. Thus volume of Swedish higher education in the past 20 years, despite the generally dynamic tenor of national development has not been allowed to increase.

In the political arena in Sweden, the impact of admission strategies to higher education has been most vigorously emphasised as an important part of educational policy aimed at realising political goals of equal opportunity for different groups, be they social, economic, ethnic or other. The introduction of a uniform set of rules for admission to practically all areas of higher education with the exception of the arts, thus played an important part in the 1977 reform of higher education. This set of rules, set up by the Riksdag, is still operating, although the policy of raising the proportion of students from disadvantaged groups has not been successful during the past 20 years. This should be related to the fact, already mentioned, that the number of study places in higher education has been constant during 20 years and that the number of applicants has greatly exceeded the number of available places.

The access system has been criticised on several counts, e.g. as being complex, uniform and centralised. As a result of this debate, the Riksdag has decided on a new scheme of selection for higher education which will operate from 1991. The aim of social equalisation still holds good. However, the new scheme strongly stresses the need for measures of academic ability to be the fundamental part, and as a consequence the role of work experience as an alternative merit is very much restricted in the new scheme. A fundamental change in the new admissions scheme will be the use of a general university test for all applicants, regradless of background. The object of the test is to give people from different backgrounds a fair chance. Differential use of test results for different study programmes is also being discussed. As already mentione, in the Swedish system of higher education planning, dimensioning and admission are by tradition highly centralised. The individual institutions have had little say in these matters, which have been as important tools for the attainment of political objectives. However, in order to develop and renew the system to be introduced in 1991, new methods of student selection must be allowed and evaluated.

Institutional differentiation

As stated earlier, Sweden has a comprehensive higher education system in which the same types of study programme are provided at universities and at the smaller and medium-sized university colleges. The differences between these establishments, however, do not only concern size and number of faculties and study programmes. There is an important difference between the eleven units with permanent research resources and those which only receive regular grants for study programmes, which means that their research is confined to assignments from industry and public authorities, plus any projects that may be funded by research councils. The Higher Education Act says that all higher education must rest on scientific foundations. The question is how far teachers at higher education establishments with no permanent research activities are able to maintain and renew their scientific competence and translate it into teaching activities, if they are not in a position to conduct any research of their own. This is an awkward problem, the dilemma being, on the one hand, to support research opportunities at the smaller units but, on the other, not to dissipate national research capacity between an excessive number of small units where efficient research environments cannot possibly be established. One of the tasks of the National Board is to make sure that study programmes at all higher education units are of "equivalent quality", i.e. to try to establish some form of national standards with reference to which study programmes can be followed up and evaluated.

Government-institution relationships

In the decentralisation process which has been going on for some cosiderable time and has now entered a particularly intensive phase, universities and university colleges are in various ways being given greater autonomy and, accordingly, increasing responsibility for planning, resource allocation and development. Important changes are being made to funding and budgeting systems, with the result that State funding of universities and colleges will be more on lump-sum basis. Whereas at present higher education units receive their educational funding in the form of an allocation for each of five educational sectors and another allocation for separate single-subject courses, in future they will receive a single grant for all educational activities within the unit, to be distributed at their own discretion between the different study programmes which the unit offers. Perhaps an even more important change is that planning and budgeting periods, currently comprising one year, which will facilitate more long-term planning and, hopefully, more efficient utilisation of resources. Study plans for general study programmes, hitherto defined at central level, are now to be designed by the individual higher education unit, with certain exceptions regarding study programmes for caring and teaching professions.

Of course, this decentralisation of powers to universities and university colleges does not mean that the Government and Riksdag intend to relinquish all control. A change is being made from management by instruction to management by objectives, and in orde for the latter system to be viable, activities have to be followed up and evaluated more systematically than has previously been the case in Swedish higher education. Quite logically, responsibility for follow-up, quality control and activity auditing is also being mainly entrusted to each individual higher education unit. In addition, the National Board has the task of following up developments at national

level, acting as a supervisory authority for higher education activities and helping to establish a viable system of follow-up and activity auditing within the higher education sector. This being so, evaluation questions naturally have high priority in Swedish higher education, one such aspect being the development and use of performance indicators.

THE EVOLUTION OF THE INSTITUTIONAL EVALUATION AND UNDERLYING ASSUMPTIONS

Sweden has been a strong believer in rational planning. In the education sector, all types of school from pre-school to post-secondary education have undergone national reforms, preceded by years of committee work, research and investigation. When the higher education reform was introduced in 1977, prepared by a committee which was launched in 1968, however, the efficiency and impact of large, central reforms had already begun to be queried, and the Riksdag decided, for the first time, that this reform was also to be followed up and evaluated. Subsequently, most of the partial reforms introduced in the higher education sector have also been evaluated and modified.

The accelerating intake of students in higher education during the sixties emanated partly from the reforms introduced in compulsory and upper secondary schooling. The debate on the dimensioning of post-secondary education and on improving efficiency by means of faster through-put was becoming more and more intense at this time. Quantitative questions occupied the focus of attention, and a number of important qualitative problems were relegated to obscurity. Official education statistics served as an evaluative measure of educational efficiency. A new registration system was introduced in subject departments to establish a firmer basis for appraising the efficiency of different study programmes. This, perhaps, can be termed the beginning of evaluation by means of performance indicators in Sweden, with through-put and drop-out data being interpreted as information on the efficiency and quality of study programmes. At the end of the 1960s, Urban Dahllöf, Professor of Education, undertook a renewed analysis of previous through-put studies, which he vigorously criticised. On the strength of research in this field, he was able to show that through-put and drop-out rates had been misinterpreted as a result of the evaluative approach adopted. Once it could be shown that graduation statistics were inadequate as a means of evaluating educational achievement, demands were presented in various quarters for a more balanced picture of the post-secondary education situation. Qualitative descriptions were called for, at the same time as the emphasis of a still growing interest in evaluation shifted from a summative to a formative approach, so as to be able, continuously, to transform and develop teaching and education on the basis of evaluation. The controlling function of evaluation was thus toned down and evaluation was problematised in a completely different way from previously.

The evaluation, resolved on by the Riksdag, of the 1977 higher education reform was entrusted to the National Board. A five-year programme of reform follow-up was devoted to a small number of indepth projects, as opposed to a more comprehensive and, accordingly, more superficial follow-up. The basic idea was for the programme to be an adjunct, at central level, to a continuous follow-up of the reform at local level. Subsequently each steering agency at various levels would be directly responsible for a continuous evaluation of higher education activities. A special activity auditing

project under the programme had the specific purpose of encouraging self-evaluation at all levels of the higher education system and thus helping "to augment the capacity of the higher education authorities for critical analysis and evaluation of their own activities, with reference among other things to goal achievement, efficiency and capacity for renewal". The growing realisation, aroused in many quarters, of the need for evaluating one's own activities has not, however, invariably resulted in action. One reason is that there was no demand anywhere for the results of these evaluations.

This is the situation now that the Government and Riksdag are switching to management by objectives, with the demands it implies for systematic follow-up and evaluation. In other words, there is a certain tradition, mainly of following up and evaluating innovations and reforms, and a certain amount of spade work has begun under the so-called activity auditing project, which has produced a dawning awareness of the desirability of autonomous, internal evaluation at all levels. Hitherto, however, this evaluation at different levels, which is going on all the time, has for the most part stopped short at the persons most immediately affected and has not been applied to a more concerted assessment of the quality of activities. Higher education governing bodies have now been given the task, through the Higher Education Ordinance, of "ensuring that activities are followed up and that the results are analysed", and the Government and Riksdag will be requiring "in-depth activity audits" from universities and university colleges every three years.

The motives underlying the new activity auditing can above all be stated in terms of increased public accountability and, secondly, quality improvement and control in connection with the ongoing process of decentralisation. The National Board now has the task, together with universities and colleges, of drawing up a plan for the organisation and co-ordination of evaluative responsibilities at the different levels. That work has just begun.

ORGANISATIONAL MECHANISMS

As described above, responsibility for developing a viable system of evaluation and activity auditing has been vested in the governing bodies of universities and colleges and the National Board of Universities and Colleges. In many higher education units, discussions, staff training and experimental activities have been inaugurated at various levels, partly with a view to quality control and auditing within the individual unit, and also jointly by two or more universities and colleges, with a view to developing common criteria and facilitating comparisons. Within the Research and Development (R&D) Unit of the National Board, a number of pilot projects have been started together with various universities and colleges.

The National Board itself is currently being thoroughly re-organised so as to divert the main focus of its activities from planning to follow-up and evaluation. The new organisation comes into force on 1st January 1990. Meanwhile preparations for the task of developing follow-up and evaluation in higher education are being made by a project group at the National Board, which is due to present a draft statement of principle and a sketch plan, to be discussed and finalised by universities and colleges.

CHARACTERISTICS OF AN INTENDED SYSTEM OF FOLLOW-UP AND EVALUATION

As part of the preparation for systematic follow-up and quality control in higher education, the National Board invited all vice chancellors of universities and colleges, as well as heads of administration, to attend a conference on these matters in th autumn of 1988. At that conference various examples were presented, showing the procedures adopted in a number of other countries. In addition, it was proposed that Sweden should not introduce a completely new, uniform system of follow-up and evaluation for higher education, but should build on and develop further the forms and embryos of evaluation already existing. We regard research and higher education, compared with other social sectors, as to a great extent "self-evaluating systems" with many in-built quality checks and incentives, albeit referring mainly to research. This system, then, needs to be supplemented in various ways, but it is essential for the methods then applied to support, strengthen, stimulate and challenge the in-built self-auditing and the pursuit of quality which are distinctive characteristics of an efficient professional organisation.

A fundamental component of this system would be the annual report on higher education activities published by the National Board. All universities and colleges send in documentation concerning their activities during the past year. This comprises recurrent statistical data on resource utilisation and results, together with remarks on the year's results and events. At the National Board this material from all universities and colleges is systhesises and analysed at national level and published as the annual report.

The activity auditing initiated, especially at subject department level, in connection with the follow-up of the higher education reform should be capable of revival and of playing a more important part in the new steering systems. The subject department as an organisational base unit and a physical and social environment for both research and teaching has a vital bearing on the qualities and results of these activities. But other types of service unit, such as libraries, information processing centres and administration, should also follow up and evaluate their own activities.

The evaluation of courses and complete study programmes is common practice in higher education, however, as a means of supplying governing bodies with input documentation for improving and developing content and teaching. Given the new tasks of auditing quality and giving an account of results, it will be essential not to perform isolated evaluations but to relate those evaluations to corresponding analyses in other units. The National Board will doubtless be taking the initiatives to bring about national evaluations of study programmes and research fields, but every university and college can and should take initiatives of its own to bring about common evaluations of different parts of its activities. Examples of such projects already exist, but they need to be multiplied several times over. Apart from comparisons between Swedish universities and colleges, it is also desirable that certain comparisons should be made with corresponding study programmes in other countries. Co-operation is now being developed, primarily with the Netherlands.

Where research is concerned, national evaluations have also been conducted in Sweden, partly by the Natural Science Research Council in certain fields, and also with reference to entire disciplines, viz history and sociology, by the National Board in collaboration with the Council for Research in the Humanities and Social Sciences. These evaluations have taken the form of international peer-reviews.

It is impossible yet to predict how these different parts and others which may be added will be combined and will devotail with each other so as to fulfil the twin functions of evaluation, which are to provide input documentation for quality development and renewal and improved efficiency, and also for activity auditing and quality control. An initial sketch for a plan of this kind is to be presented in February 1990 by the project group mentioned earlier.

TECHNICAL ISSUES IN THE OPERATION OF THE SYSTEM

In this section I will confine myself to that part of the information base for the follow-up of higher education activities which refers to quantitative basic data relating to the annual report.

These statistical data which, for six years now, have been regularly collected and presented in the annual report, are as follows for under-graduate studies:

- no. student equivalents provided
- no. student equivalents utilised
- no. annual student equivalents provided
- no. annual student equivalents utilised
- total credit (point) production
- total expenditure
- total no. graduations.

All data are presented by study programme or group of closely related study programmes, and also for separate courses. They are then presented both by sectors (in five educational sectors) and by university/college. The possibility is now being discussed of expanding the regularly collected statistics so as also to include data on the scope and character of commissioned education and on teacher number and competence. The annnual report common to the whole of the higher education system needs to include not only data required for input at central level in the system but also data which primarily concern the individual higher education unit, where it will be necessary to be able to compare one's own resource application and results with those of other universities and colleges. As a service to all higher education units, then, the central authority should supply common base data facilitating various types of comparison within the system. Locally desirable daa of this kind include, for example, data concerning libraries, information processing centres, administration and other functions common to the unit.

The financial report on activities includes an account of expenditure during the year. This account indicates funding agencies, both higher education grants for undergraduate study programmes, research and facilities, and external funding from various sources, such as research councils, sectorial research agencies, industry and so on. The account given is not exact, but it does show the volume of each activity and its size in relation to other activities.

The Government and Riksdag have called for more data on research. Statistics Sweden and the National Board of Universities and Colleges have been instructed to develop a system of research cost-accounting at subject level (and not just faculty level, as at present). In an initial experimental round, now in progress, data are being collected by subject department and also by defined subject fields. No specific demands have yet been presented for the reporting of research results, but in a Government Bill from 1988 concerning the structure of higher education policy, we read that "departmental boards, study programme committees and higher education governing bodies, as well as the National Board of Universities and Colleges, must develop reasonable yardsticks of results showing, in a manner intelligible to the general public, how Swedish higher education and research are placed by international comparison". Local experiments using indicators of various kinds are now being developed and have been in use for several years in some quarters. Indicators of research productivity and quality, e.g. in the form of publication and citation index frequencies, have also been used in special evaluative projects.

As regards questions concerning the reliability and comparability of these data, a lot of work has been devoted to preparing distinct definitions of the nature of the data and instructions as to how they are to be delimited. This is also the matter of the criteria to be applied to any new data on which the common annuel report is to be based. Even if these definitions and instructions are fully complied with the data will inevitably reflect differing conditions and situations in different types of higher education establishment and in different faculty and subject fields, so that they cannot be directly used as a basis for decision-making or combined into more complex information unless one is closely familiar with the special circumstances of a field or unit.

THE INTENDED OUTCOMES OF THE PROCESS

With a more systematic follow-up and evaluation of the Swedish higher education system still under construction, it is too early to pronounce on the outcomes of this process. In discussions hitherto, the prevailing attitude has been that the system of indicators developed must not be directly linked to resource allocation at central levels. The basic statistical information described above is intended to supply continuous description and overview of available resources and of quantitative results of higher education and its development over time. This basic information must also be capable of serving as a signalling system at both central and local levels when major deviations in any respect or an undesirable tendency can occasion closer investigation of the underlying causes. Even if certain basic data can be linked up with aspects of quality, the quality control of both research and education must be conducted with different procedures and in direct contact with the active process concerned. The basic information collected at central level is not designed to place Sweden's universities and colleges in ranking order but to help all units to maintain an internationally good standard of productivity and quality.

Universities and colleges have recently developed local indicator system which have been made the basis of budget readjustments and of limited parts of resource allocation. In a recently presented report on four such local models, it is observed thatn, even if the proportion of resources thus redistributed has been marginal, the system has played a useful part in heightening awareness of the responsibility of subject departments and research groups for the efficiency and quality of their activities. Attention has also been drawn, however, to the risks entailed by a prolonged use of the same limited array of indicators, which is very liable to have a one-sided steering effect on activities.

The evaluations of different kinds which have been performed as a result of local or central initiative have seldom been primarily concerned with bringing about a reallocation of resources but have had the more general aim of scrutinising and improving the quality of the activities in question. One of several measures resulting from the evaluation findings can have been, of course, the augmentation, reduction or redeployment of resources.

ISSUES IN THE DEVELOPMENT OF PERFORMANCE INDICATORS AND INSTITUTIONAL REVIEW

I have deliberately refrained here from any explicit definition of "performance indicators". I have used the term as I believe it to be understood above all in the indicator development work which has been done in the UK, i.e. as a quantifiable signal (as opposed to a measurement) emphasising performance (as opposed to intention). This relatively new concept in the "evaluation trade" is not all that firmly rooted in Swedish discussions of university and college evaluation and it is used in a variety of senses; it has come to be a convenient blanket term for something pretty vague. In a possible subsequent account of the work now being done to develop evaluation in the Swedish higher education system, there may be cause to give closer consideration to our definition of the concept.

Current issues regarding that portion of follow-up and evaluation which comprises quantitative indicators refers mainly to questions concerning their appropriate scope, which in turn is connected with what can be considered an acceptable, i.e. intelligible, degree of complexity at various levels of the system. The crucial question with regard to the design and scope of indicators is, of course, the purpose for which they are to provide input data, ranging from service primarily as a signalling system to serviceability as direct basis for decision-making. These purposes can vary between different levels, ranging from a group of teachers in charge of a course, a departmental board, a faculty board to senior higher education management and central administrative and political levels.

The crucial question of how the development of different forms of evaluation in higher education will proceed in Sweden during the newt two or three years is connected with the development of the new system of management by objectives which the Government and Riksdag are now introducing but have not yet worked out in concrete terms. Goal definitions at central level will play a more important part than previously in developing evalutive criteria, but the central objectives will have to be supplemented by the goals and intentions which each individual university or college defines for its activities and, similarly at other levels, each within its own particular field of responsibility. But there is more to a steering system than good

goal definitions. The fact of deciding whether or not the dynamic process of qualitative development and renewal can be launched in higher education with the aid of follow-up and evaluation is the possibility of linking the outcomes of evaluation to the consequences implying that good work is rewarded and substandard performance rectified or discarded. There are many such quality controls and rewards/sanctions in research activities, but very few in education and teaching. Understandably, interest has been made to focus almost entirely on resource allocation as a steering instrument, but creative thinking is also needed here concerning other types of policy lever to promote the development of quality in higher education and research. This, I believe, is a crucial question which will decide whether the extensive work which is already being devoted to quality control and evaluation and which is subject to growing demands will become an instrument for development or merely a bureaucratic imposition. In Sweden we are now at a stage where it is still possible for development to be steered along the first mentioned of these tracks.

THE CONTEXT

Institutional and departmental performance assessment and performance indicators attracted limited attention in United Kingdom universities during the 1970's, particularly amongst academics. While most institutions produced internal management statistics and performance indicators, primarily input and process measures, there had been little systematic discussion of their strengths and weaknesses or of how they should be used to support planning, decision making and control. Nor was there any systematic exchange of management statistics and performance indicators between institutions either side or across the binary university vs polytechnics line.

While a Seminar on Institutional Adaptation and Change in the United Kingdom in 1981 provided an opportunity to place institutional performance assessment and performance indicators more firmly on the agenda for the 1980's, two events aroused interest in, and raised the importance of performance indicators. Firstly, the election of a Conservative Government in May 1979, and, secondly, the highly selective approach adopted by the University Grants Committee (UGC) in implementing reductions in recurrent grants in July 1981. Though the UGC never published its criteria it was widely assumed that input measures such student grade, level scores from secondary school, were employed. However, the more significant influence was Mrs. Thatcher's arrival in Downing Street.

Since the election in May 1979, economy, efficiency and effectiveness, value for money, performance indicators, executive styles of management, devolved budgeting and accountability within institutions, and departmental and individual performance assessment have risen high on the agendas of the Treasury, the Department of Education and Science (DES), the funding bodies (UGC and NAB and their successors, UFC and PCFC), of Vice-Chancellors and Polytechnic Directors, and academics and administrators.

THE DEVELOPMENT OF THE PERFORMANCE INDICATORS MOVEMENT

The Conservative Government has been committed, not only to reducing public expenditure and to a market economy, and, therefore, requiring institutions to seek additional non-governmental funding, but also to justifying their activities and accounting for their use of resources and their performance in terms of:

- *economy* in the *acquisition* and *use* of resources,
- *efficiency* in the *use* of resources, and
- *effectiveness* in the *achievement* of institutional, departmental and individual objectives, through the successful implementations of strategies and action plans.

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This requires, as elaborated in the *Report of the Steering Committee for Efficiency Studies in Universities* (The Jarratt Report in 1985), the development of strategic plans to underpin academic decisions and structures, which bring planning, resource allocation and accountability together into a corporate process linking academic, financial and physical aspects. Important aspects of *effectiveness* are responsiveness to, and relevance to, the needs of a post industrial, advanced information and manufacturing technology society, including widening access to higher education as the 18 year old population declines; contributing to the improved performance of the economy; matching competition in producing more qualified scientists, engineers, technologists and technicians; and developing the ability to adapt to change. Selectivity in the allocation of resources available for research; critical evaluation and rationalization of small, weak departments; and continuous striving for improved quality and excellence in teaching are other important dimensions of effectiveness. Thus the government expects institutions to be accountable to the UFC and PCFC, and through these funding bodies to the DES, the Treasury, and Parliament, for providing *value for money*.

The Government also wishes to reduce its commitments to funding higher education and expects institutions, through an increased entrepreneurship and market oriented focus, to build up alternative funds. Reduced dependence on government funding and increased diversity of sources of funding, it is argued, will restore institutional autonomy which implies the need for strengthened accountability mechanisms. Over emphasis on government funding and excessive direction from funding bodies is seen to inhibit responsiveness, creativity, innovation and diversity of provision. There are, therefore, pressures on institutions, particularly universities, to change their "culture" from the free oligarchic and consensus model, supported by administrative styles of management, which assumes that strong professionals on lifelong tenure are allowed to regulate both resources and academic developments and judgements through collegial means, to an entrepreneurial and market economy model with executive styles of management. Thus, the Jarratt Report recommends the appointment of heads of departments by the University Council on the recommendation of the Vice-Chancellor after appropriate consultation, with clear duties and responsibilities for the performance of their departments and for the use of resources. It is heads of departments that should be held *accountable* for the use of resources and for the successful implementation of strategies and action plans, not the department as a whole.

Publicly available performance indicators (PI's), it is further argued, are key inputs into the process of accountability, both internally within the institution and externally to funding bodies, governments and society. In a market economy model they should be an important source of market intelligence for consumers. The university sector has taken the lead in the development of a comprehensive, publicly available, set of PI's and management statistics to assist both institutional decision making and internal and external accountability.

Planning and resource allocation, the central concern of the Jarratt Report, particularly during times of financial constraints and changing demands, involves making choices between mutually exclusive alternatives each with its own combination of inputs, outputs, outcomes, impacts and benefits. PI's and management information should inform decisions. They provide a starting point from which academic and managerial judgements should be made.

They are no substitute for such judgements, but the fewer the indicators the greater the gap that has to be bridged by such judgments. Having made decisions and identified appropriate progress measures of performance, a comparison of expected with actual PI's should form one part of the assessment of whether past decisions have been successfully implemented. Therefore, it is not surprising that current developments in the development and use of performance indicators in the United Kingdom flow from the conclusion in the Jarratt Report that:

> There is a recognized need for reliable and consistent performance indicators.
> These need to be developed urgently for universities as a whole and for individual universities as an integral part of their planning and resource allocation process. (CVCP, 1985, p.22)

This conclusion led to the joint recommendation to the UGC and CVCP:

> A range of performance indicators should be developed, covering inputs and outputs and designed for use both within individual universities and for making comparisons between institutions. (CVCP, 1985, p.36)

And the recommendation that all universities develop "reliable and consistent performance indicators".

In May 1985 the Government published a Green Paper, *The Development of Higher Education into the 1990's* (DES, 1985), in which it stated the recommendations in the Jarratt Report merited early and careful consideration. It recognised sound management is based not only on efficient use of resources (inputs) but also on the effectiveness of results achieved (outputs), which necessitates the need to develop and use measurements of performance. The Green Paper stated:

> The Government believes there would be advantage in the regular publication of a range of unit costs and other performance indicators by institutions and by departments. It therefore welcomes the Jarratt Report's suggestions for developing reliable and consistent performance indicators designed for use both within individual universities and for making comparisons between them. The developments of such indicators will be important for the internal management of institutions and for the development of a policy on the allocation of resources more generally. (para 7.5)

An outline of the state of work at that time in the Departments of Education and Science (DES) is contained in Annex B of the Green Paper. It acknowledges that there are significant difficulties in measuring performance in higher education, that some benefits may not be quantified readily or at all, and that activities and objectives are multiple and relative values are not readily assigned. Because of its awareness of these difficulties and of the dangers of abuse and misuse of performance indicators tests, the joint Working Group established by the CVCP/UGC in response to the Jarratt Report initially proceeded cautiously.

In July 1985, the Secretaries of State for Education and Science and for Northern Ireland established a committee, under the Chairmanship of Lord Croham, with the following terms of reference:

> To review, within the context of expected development in higher education, the University Grants Committee's constitutional position and role in relation to the Government and to the universities, its membership, its internal structure and working methods, and its secretariat.

The Committee reported in February 1987. Its key recommendation was that the UGC should be reconstituted as a University Grants Council, an independent body under the sponsorship of the Secretary of State for Education and Science. The Croham Committee's remit for the proposed new Grants Council included an obligation "to collect, examine and publish comparative information about the universities". The Committee considered the UGC did not have the professional capability to adequately interpret the information which was already available on university finances and universities' performance. It concluded:

> 7.13 If the UGC cannot manage its information flow, it cannot do its job. That is why we attach importance to our recommendations (paragraph 4.38) for the establishment of a properly staffed Management Information Service, whose Director is fully integrated into the top management of the UGC.

It envisaged the Management Information Service would be responsible for the *supply of management information* to the Director General and to the Council, including *selection and development of appropriate performance indicators*. In a subsequent White Paper, *Higher Education: Meeting the Challenge* (DES, 1987a), the Government announced that it proposed to establish a Universities Funding Council (UFC). It welcomed and endorsed the Croham Committee recommendation that arrangements for the flow of information and for accountability from the universities to the UFC and onwards to Government should be much improved.

The Universities Funding Council was incorporated on 1st November 1988 and became fully operational on 1st April 1989. In a letter to Lord Chilver, Chairman of the UFC, providing broad guidance on the functions of the Council, on Government policies which are relevant to the exercise of these functions, and on particular matters to which he expects the Council to have regard, the Secretary for Education and Science, Kenneth Baker (1988) states:

> 27. ... it will be for the Council itself to devise appropriate means of allocating funds between institutions. I shall however expect to see two key features. The first is a means of specifying clearly what the universities are expected to provide in return for public funds. The second is a *systematic method of monitoring institutional performance* (author's italics). I attach particular importance to the latter since, without the measures of performance, the Council will have the means neither of satisfying itself that insittutions are providing what has been promised at acceptable quality, nor of making comparative assessments as a basis for future allocations of grants.

> 28. The Council inherits a good start made by the UGC in importing judgements of quality in the allocation of funds for research. Building on the work already in train with the CVCP, I look to the Council to *develop further indicators of both the quality and quantity of institutions' teaching and research* (author's italics) and should be grateful if it would carefully consider how these might be used as an input to its funding policies and decisions. Generally, I look to the Council to continue the move towards greater openness in the resource allocation process.

Thus, accountability and the use of performance indicators as part of the accountability process is high on the agenda of the UFC, as it was of the UGC.

An important new dimension of the accountability process is the requirement on the UFC not to think of funding institutions in terms of grants and student numbers, but in terms of contracts specifying what the universities are expected to provide in return for public funds. At the time of writing, both the funding councils (UFC and PCFC) are moving towards contracts with combinations of funding of institutional mission statements and plans to provide teaching and research, and competitive bidding for proportions of funding; probably higher in the case of UFC than the PCFC. Governing bodies and managements will be held accountable for implementation of institutional plans and delivery of educational provision contracted for. Competition between institutions for students has also been stimulated by the substantial increase in tuition fees for full-time home undergraduates with a commensurate reduction in contract funding of institutions.

Interestingly, both the PCFC and the UFC appear to be thinking in terms of teaching contracts to fund process (FTE's) rather than produce outputs (graduates) of a specified minimum quality. A UFC consultative letter (20/89, 25 July) on funding and planning 1991/92 to 1994/95 includes the statement:

> Funding to be based on competitive bidding for numbers of students against a price for full-time equivalent students determined by the Council.

This emphasis on funding process is because the Secretary of State in his inaugural letters of guidance to the Councils defines "accountability" in terms of delivery of provision rather than delivery of outputs. Furthermore, the philosophy appears not simply to be one of employing dominant buying power to purchase teaching and research at the lowest cost, but of securing value for money, including responsiveness, relevance, innovation and creativity, selectivity, hard choices, quality and excellence.

The UFC is thinking in terms of institutions bidding against price per FTE, but other things being equal, favouring universities which submit low bids. However, bid prices alone will not be the sole determinant of funding decisions. The Council will take account of the extent to which future plans contribute towards meeting the Council's Aims. Funding of research will continue to be strongly competitive on the basis of quality. Universities are expected to adapt their plans, where necessary, in order to contribute to the UFC's Aims, and performance in this respect will be taken into account when funding decisions are taken during the 1991-95 planning period. Whatever the methodology, it is clear that a key determinant of effectiveness is *quality*, both of teaching provision and research. All of this implies that

institutional, departmental and individual performance assessment, including comparative quality judgements, has not only become an important dimension of institutional and departmental management, but is likely to become more so.

CONCEPTUAL FRAMEWORK AND ORGANIZATIONAL MECHANISMS

The joint CVCP/UGC Working Group (now the Joint CVCP/UFC Performance Indicators Steering Committee) was established in July 1985, and in its initial work was concerned with developing a sound conceptual basis for the subsequent development and publication of PI's. This conceptual stage was essential because of the initial suspicions of many vice-chancellors and academics concerning the use, and possible abuse, of PI's. It was also necessary to proceed carefully and slowly in the early months, because of the need to consult with, and take account of the views of, universities.

The Working Group adopted the Jarratt Committee's recommendation as its terms of reference and accepted PI's, as an aid but not a substitute for judgement, as essential management information. It decided its work should be directed primarily to the major functions of *teaching and research*. In doing so it has had two broad purposes in mind:

i) to assist in better accountability, and

ii) to provide management tools for use at different levels within the system.

It has sought to develop practical means for the identification of the strengths and weaknesses of individual PI's in order to facilitate effectiveness and efficiency. It has recognised that whilst *judgement* must count in the end it must be based on *objective measures* of performance as far as possible.

The Working Group asked itself, *"What are performance indicators?"* and concluded they are statements, usually quantified, on resources employed and achievements secured in areas relevant to the particular objectives of the enterprise. The Group recognised the term "performance indicators" is itself significant. The emphasis is on *performance* as distinct from *intention*, and on indicators as *signals or guides* rather than *absolute measures*. It concluded sound PI's should display certain characteristics:

> They must relate to stated objectives of the organisation; in the case of universities the Group has taken these to be primarily teaching and research. But there ar many activities of universities which underpin their primary roles, or are even peripheral to them. It is proposed that indicators relating to all aspects of a university's activities be developed as soon as practicable.
>
> They must be specific, quantifiable and standardised so that the information can be used for making valid comparisons within and between institutions.
>
> They must be as simple as possible consistent with their purpose.
>
> They must be acceptable and credible in the sense of being free of systematic bias.

> They must be useful and capable of acting as signposts to areas where questions concerning operations can and should be asked.

From the outset the Group recognised that PI's are not a novel feature of universities. It requested information from universities on the use which they already made of PI's. Whilst current practices varied greatly from one institution to another it was clear that all universities had available and made extensive use of an array of management information much of which was effectively PI's. It identified a list of sixteen indicators which were commonly used in universities, given in Appendix D1; a further seventy indicators were used by one or more universities.

The Group drew a distinction between *input, process or output* indicators:

> Input indicators have to do with resources, human and financial, employed by universities.
>
> Process indicators relate to the use of resources by universities; to the management effort applied to the inputs and to the operation of the organisation.
>
> Output indicators are about what has been achieved; i.e., the products of the university.

It concentrated on process and output measures, i.e., measures of efficiency and effectiveness. It also appreciated that universities are engaged in a variety of activities and pursue a number of objectives, and it is essential, therefore, to have available a range of PI's, <u>none of which should be seen as paramount</u>, to cover the full sweep of an institution's activities. However, it also recognized that not all indicators will be equally useful for specific purposes, and the Working Group envisaged the development of some indicators primarily: a) for use within institutions; b) for inter-university analysis; and c) for comparisons across the binary line, i.e., with polytechnics and other public sector institutions of higher education.

The initial discussions in the Group were elaborated in its first statement released to universities in July 1986 (CVCP, 1986). In this statement the Group emphasised:

i) Indicators can play a particularly useful role in the identification of trends in performance, giving signals of areas where action be needed and enabling comparison of actual performance with objectives.

ii) Information derived from PI's should not dominate the management process. There are limitations to the use of performance indicators and dangers in an unsophisticated or thoughtless reliance on the signposts that they provide. For example, the undergraduate wastage rate is seen as being useful as a means of monitoring the success of an institution in the output of graduates and as a reflection of the quality of teaching. Yet the maintenance of academic standards may mean that a certain level of wastage is unavoidable.

iii) The use of performance indicators is an aid to good judgement and not a substitute for it. It cannot be assumed that even a wide variation from a central value for a single indicator is either desirable or undesirable. There are dangers of considering individual ratios in isolation.

iv) Performance indicators should not be used to impose standardisation either within an individual institution or more widely. The diversity of the higher education system is one of its strengths.

In view of the already widespread and well established use of PI's within universities, the Working Group saw its principal task as being to draw on this experience to standardise existing practice by formulating common definitions and developing an agreed list for use by all universities. The decision to concentrate attention initially on teaching and research posed the Working Group with difficulties associated with the intangible, and longitudinal, nature of the outputs, and it has still not resolved these. The Group also looked at other aspects of universities' work where it believed data was available for the immediate implementation of valid and useful information.

A large number of possible PI's was proposed and each was tested against the following questions:

What is the formal definition of the performance indicator and how should it be calculated?

Is the performance indicator relevant to the objectives of the organisation?

Can the relevance of the performance indicator be quantified with any precision?

Can the measurement of the performance indicator be carried out objectively?

Would the performance indicator be of any practical value to the management of the organisation?

Would the performance indicator be acceptable to the "manager" and other members of the organisation, and would they agree that its use could contribute to an assessment of efficiency by outsiders?

Would the performance indicator be of practical use to those who are outside the department and have a legitimate need to assess its effectiveness and efficiency (a) within the university, e.g., the planning committee (b) outside the institution, e.g., the UGC or relevant research council?

Are the data needed already collected in a satisfactory for and by means of an acceptable agency? If not, what further action is needed to establish and appropriate mechanism?

What guidance should be given to institutions on the use of this performance indicator? Are there pitfalls to be avoided?

What other data or secondary indicators need to be taken into consideration?

What would be the cost of producing the performance indicator in relation to the benefits?

Testing the Group's first proposals against these questions revealed a number of possibilities which had management potential for individual institutions and the university system as a whole. The Group suggested (Appendix D2):

a) a limited number of PI's where the necessary information was available for their introduction to be possible during the academic year 1986 -87 (column 1); and

b) a further group for which it was believed the necessary information could be collected. In some cases it was believed this could be done relatively easily (column 2), but in others new data collecting machinery would have to be constructed (column 3).

The recent emergence of thirty nine UGC cost centres allowed the Group to distinguish between three levels of use (Appendix D3): department, cost centre, institution.

Some universities were already using a much wider range of PI's, often within the framework of analysis of some sophistication. For these institutions, the work of the Group may have seemed somewhat disappointing. However, the Group sought to bring into operation relatively quickly indicators relating to what are arguably the most important roles of the universities: to enable all universities to engage in monitoring their activities with the sophistication currently practised only by some.

For each indicator proposed the Working Group addressed itself to several issues:

i) <u>Definition</u>

Clarity is essential if a formalised construction which would permit valid comparisons within and between institutions is to be made.

ii) <u>Applicability</u>

Individual performance indicators will not have equal relevance or value in all contexts. The Group has concentrated primarily on those indicators which would seem to have their greatest relevance at the intra- and inter-university level.

iii) <u>Usefulness</u>

The usefulness of the indicator to decision-makers is examined, considering its use both to managers within the institution and to those concerned at the national level. Analysis of trends over time provide signals of changes in performance which may be investigated and halted or encouraged as appropriate.

iv) Caveats

The Group considered the caveats which are relevant to interpretation and some comments and advice on their use in practice. These have focused on factors which may limit complete compatibility between cost centres within institutions, and between institutions.

v) Action

The Group has outlined the action that needs to be taken before the indicator can be put into operation.

Excepts of the Group's work on individual indicators are provided in Appendix D3.

The range of indicators proposed for immediate use was not large. Why were certain familiar measures omitted? One of the key issues to which the Group addressed itself was that of valid comparisons between institutions; some indicators which are used within institutions are inappropriate for making comparisons between institutions. For example, the Group excluded classification of honours degrees awarded as an indicator of teaching quality. Degree class reflects not only the quality of teaching which students have received but also their own abilities, and the Group saw no valid way to separate out the relative contributions of these two factors. It concluded, however, that trends in degree classes awarded over time may provide useful signals to an individual department within a particular university even though the use of classification of honours degrees awarded is inappropriate for making inter-institutional comparisons of teaching quality. The Group also considered other ways in which evidence of teaching quality might be sought as it was convinced that there is a need for universities to undertake formal appraisal of teaching as a matter of good practice. It advocated the development of a system of individual teaching appraisal in all institutions. It saw the use of student questionnaires on the content and presentation of courses as an important element in this analysis. More controversially, the Group excluded 'A' level entry scores because it did not regard them as a performance indicator. They are a measure of institutional attractiveness, and it can be argued that attractiveness is partially a function of past performance. The Working Group has come back to some of these familiar measures in its recent work.

Thus the Working Group's first statement concentrated on creating an operational framework and on determining the mechanisms necessary for the implementation of PI's. There was still much to do in devising specific indicators for a wider range of universities' work. The Group stressed that the proposed schedule for implementation was dictated by the availability of data or the existence of machinery to collect it, not the relative significance of the proposed indicators. Indeed it regarded those indicators which will require the greater time and effort to bring into operation as being among the more important ones in this initial range, e.g., measures of research output and differentiation of costs of teaching and research.

The first statement was well received by the CVCP, UGC, DES, and the Universities. A Technical Committee (now Performance Indicators Editorial and Development Group) was established which assumed the task of defining and evolving the initial range of PI's proposed.

During the course of 1986-87 the Technical Committee identified 39 indicators (see Table 4) which could be published from existing data held by the University Statistical Record (USR). These were presented in outline in the Working Group's Second Statement published in July 1987 (CVCP, 1987). The second statement summarises and discusses universities' reactions to the First Statement and reaffirmed institutions commitment to the use of indicators in aiding good management, improving accountability and providing comparisons both within and between institutions.

Part Two of the second statement comprised a Report from the Technical Committee to the Working Group, which recommends the introduction in 1987 of 39 suites of indicators for 1984 - 5 and 1985 - 6, and the recommended format for their presentation. The first set of University Management Statistics and Performance Indicators was published in Autumn 1987 (CVCP/UGC, 1987). 'Management Statistics' was included in the title in order to emphasise their usefulness to other management functions in addition to performance assessment, and to convey, even before the document is opened, the need to consider carefully the inferences that can be properly and usefully drawn from the figures. In his introduction the Chairman of the newly established joint CVCP/UGC Performance Indicators Steering Group (which replaced the Joint Working Party), Dr. Ewan Page, Vice Chancellor of the University of Reading, concludes:

> This publication should bear the following warning to all users, whether in government, universities or elsewhere, uncritical use of these indicators may seriously damage the health of your university.

The joint CVCP/UGC Steering Committee oversaw the development of further indicators in 1987 - 88. Under the steering committee's auspices, the technical work has been undertaken, by two groups. An editorial and development group, which prepared the 1988 volume of Management Statistics and Performance Indicators, and a sub-committee on research performance indicators. The sub-committee has been considering the methodology to establish research output indicators, which it recognises will require considerable time and effort to bring into operation. (See Appendix D5).

The 1988 publication (CVCP/UGC, 1988) contains a number of improvements and innovations to the layout of the tables. Four new areas of management information are incorporated within five new tables or sub-tables which enlarges the number of indicators to 54. The print quality for both texts and tables is enhanced in the 1989 Edition (CVCP/UFC, 1989), and changes have been made in presentation in response to consultations with universities in the autumn of 1988. In order to give greater clarity, for example, introductory notes are given to each of the tables, and definitions of the statistics and PI's have been separated from caveats about their use. Definitions are now all consolidated as an appendix. The third edition is available on disc, which the Education and Development Group believe will help institutions use this data together with their own databases. The statistics and performance indicators have been consolidated in 11 tables. The 1989 edition also includes an illustrative commentary on the interpretation of some of the

indicators, together with a warning to the Press that very few important characteristics of a university can be described in a single number. Misuse and abuse by the Press is one of the major problems arising from the development of publically available performance indicators. An abstract from the 1989 publication is provided in Appendix D4.

Indicators of Institutional Financial Health Group

An institution's annual financial statements are key accountability documents concerning both the governing body's propriety and stewardship responsibilities and the institution's financial health. The importance of improved financial management, financial forecasts, and indicators of institutional financial health increases when a country's higher education policy moves towards greater institutional autonomy, increased competition and differentiation between institutions, reduced dependence on government funding, and greater diversity of sources of funding. Under these conditions there is the possibility of an institution becoming inadequately financed, and, therefore, unable to maintain the quantity and/or quality of teaching and research it has contracted to deliver. As the financial crisis at University College, Cardiff and, to a lesser extent, the University of Aberdeen, and the financial plight of some University of London Colleges, have highlighted, it may become insolvent. Hence the development of requests by the UGC/UFC for increasingly detailed financial forecasts, and the parallel requests from the PCFC.

Given the importance under conditions of greater institutional autonomy governments' place on governing bodies' responsibilities for the sound financial management of their institutions, there is a case for including indicators of financial health in the annual financial statements, for their regular reporting to the funding councils, and also for the publication of inter-institutional comparisons. An essential prerequisite is the establishment of an agreed accounting standard for published financial statements. *A Statement of Recommended Accounting Practice: Accounting in UK Universities,* (CVCP, 1989) has been franked by the Accounting Standards Committee, and a joint CVCP/UFC Group, Chaired by Prof. John Sizer, is developing a set of indicators of institutional financial health for inclusion in the CVCP/UFC *University Management Statistics and Performance Indicators.* It has met on two occasions, has identified a set of indicators, and plans to issue an exposure draft to universities early in 1990.

Summary of Progress to Date

The joint CVCP/UFC Steering Committee has concentrated on input, process, and only two sets of output/outcome measures (destinations of graduates after 6 months and number of successful leavers, i.e., completion rates) are included amongst the 54 indicators presented in 1989, because considerable, and difficult, work is still being undertaken on effectiveness measures, particularly in the area of research and the longitudinal impacts of teaching outputs. The PI's are, therefore, more useful in assessing efficiency than effectiveness, but, of course, an institution can only be efficient if it is effective. Thus the work to date demonstrates that, whilst published PI's have a significant contribution to make to the external accountability process in the area of efficiency, and to the internal management of institutions, it is more limited in respect of the process of external accountability for effective management of research funds and for

teaching quality assurance. However, as the PCFC and UFC have acknowledged, PI's will assist funding bodies in monitoring the implementation of funding contacts and institutional plans, particularly if each university will be asked to set its own objectives in quantified terms wherever possible (UFC Circular Letter 20/89). Progress measures of performance can be developed to monitor outcomes against these objectives.

Outstanding Issues

Universities are slowly recognizing, and grasping the implications, that accountability is concerned with what has been achieved not what has been spent, and that performance indicators can be used by serious institutional and responsibility centre managers, both in defining what it is planned to achieve and in measuring achievement. Accountability also implies incentives at both the institutional and department level and rewards for good performance as well as sanctions when it is unsatisfactory. It has been observed earlier that the UFC intends to take account of performance in its funding decision. All of this gives rise to the questions as to whether sufficient consideration has been given to the changing roles of heads of department and to their incentive, reward and career structure, as well as to management development programmes.

Heads of department concern about PI's also have to be addressed further. As in the case of clinicians and their responses to attempts to introduce the clinical management budgeting in the National Health Service, there is a great danger that heads of departments will not see that department performance indicators are primarily intended to help them manage their departments, to inform their decisions and assess their achievements. They may not feel 'ownership' of the performance indicators system, and may regard performance indicators as constraints rather than aides. This is because there is a conflict between the use of performance indicators by institutional management when evaluating the accountability of departmental managers for teaching, research and services, and their use by departmental managers in internal management of their teaching and research activities. At the present time the emphasis is being placed on *accountability* rather than on their use as a *tool* for the departmental manager. *Performance indicators are best interpreted and employed by the managers who can influence their outcomes.* Their use as part of the accountability process, for the achievement of the purposes for which a budget was provided, should not dominate The primary purpose of a budgetary planning and control system and the supporting management information and performance indicators, is to help the budget holder to manage his own performance. Hence, he must have ownership of the system.

Heads of departments are also concerned that excessive emphasis will be placed on short term cost efficiency at the expense of long term effectiveness. They fear sight might be lost of the fact that you can only be efficient if you are effective, i.e., you can be inefficiently effective, but not efficiently ineffective. In particular, they are concerned that high costs per FTE imply both inefficiency and ineffectiveness. A high cost department may be both effective and efficient because of the quality of its teaching and research outputs, outcomes, benefits, and impacts. Hence the concern of heads of departments that these difficult measures of teaching and research performance are not only addressed, but also properly related to input and process measures of efficiency.

Publishable PI's of institutional teaching quality are very difficult to develop. The Joint CVCP/UFC Steering Committee has considered possible indicators, but concluded some which are used within institutions, such as classifications of honours degrees, are inappropriate for making comparisons between institutions. It considers there is a need for universities to undertake formal self-evaluation and appraisal of teaching as a matter of good practice, including the development of systems of individual teacher appraisal and student questionnaires. It will return to the issue of indicators of teaching quality, not only because of the CVCP's commitment to promote such indicators, but also because of its importance in a market orientated system as part of the process of *accountability* and in ensuring customers in the market place are fully informed. To date, limited progress has been made on publically available PI's of comparative teaching quality.

PI's, publishable and internal, are only one input into the process of quality judgement, quality assurance, accountability and performance assessment; peer review has a very important part to play. It occurs at every stage of a research project's life. The UFC's 1989 research selectivity exercise was essentially a process of 'informed peer review'. For teaching it takes place when courses are accredited by the CNAA and professional bodies, externally examined, and inspected by HM Inspectorate.

It is difficult to envisage in the United Kingdom an annual publication of external peer review assessments, quality judgements, of departments and/or courses. It is doubtful whether the costs would outweigh the benefits, and it would be difficult to attract sufficient high quality people to undertake the reviews. The TIMES HIGHER EDUCATION SUPPLEMENT peer review ratings are methodologically flawed, particularly in respect of teaching quality. Many universities have introduced periodic internal departmental reviews, every three to five years, and most, if not all, use external assessors. There is a strong case for a body similar to the CNAA for the university sector, which would accredit the institution and the processes that are in place for internal reviews. This appears to be one of the roles envisaged for the new CVCP academic standards unit. Whilst it is difficult to identify output measures of teaching quality, such a process of evaluation of institutions procedures should raise the level of awareness of the importance of teaching quality assurance at the departmental and institutional level. CVCP evaluation would not cover the same ground as HMI reports nor of the Dutch external peer reviews of quality, and it is doubtful whether the CNAA accreditation procedures inform the market place about quality, ie, they are concerned with *minimum quality assurance* not with *comparative quality judgements*.

If there is to be detailed external peer review of quality of departments or subject areas, PI's should inform the peer review and help narrow the gap that has to be bridged by peer judgements. PI's provide one starting point for more detailed enquiry and questioning by reviewers. They indicate where performance differs, but not necessarily why it differs, or how to improve it. In the absence of performance indicators, the element of judgement may be too great; reliance on PI's in the absence of peer judgements is extremely dangerous. Peer review and performance indicators should, and must, complement each other.

CONCLUSIONS

This paper has traced the development of publicly available PI's for the university sector of the United Kingdom higher education systems by the CVCP/UGC/UFC Performance Indicators Steering Committee in the context of Government policy, UGC and UFC policies, and changes in institutional culture. The university sector has successfully taken the lead in the development of a comprehensive, publically available, set of PI's and management statistics to assist institutional decision making and external accountability. However, the paper has explained why considerable difficulty and complex work remains to be undertaken in respect of:

- longitudinal outcomes of teaching;
- indicators of research outputs, outcomes, benefits and impacts;
- indicators of institutional financial health;
- separation of teaching and research costs; and
- in particular, measures for teaching quality assurance and for comparative teaching quality judgements.

As the Government is firmly committed to an entrepreneurial and market economy in higher education, as well as to further strengthening of accountability for use of public funds, it is to be expected that it will continue to press the CVCP and the UFC on these issues.

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APPENDIX A

List of Performance Indicators Proposed in Australia

The reader is strongly advised to review the section on Australia of the Compendium in order to understand the context, stage of development and likely use of these indicators.

APPENDIX A

REPORT OF AVCC/ACDP WORKING PARTY ON
PERFORMANCE INDICATORS
AUSTRALIA

TABLE 1: INDICATORS OF INSTITUTION CONTEXT

INDICATOR	DEFINITION
Staff	
(a) Equivalent Full Time Academic Staff (EAS)	DEET definition for teaching and research staff
(b) Research only staff	Full-time and fractional full-time research only staff whether funded by recurrent funds or grants
Students	
(a) Student Demand	
- for undergraduate awards - commencing students	
(i) Preference Ratio	No. of first preferences divided by commencing enrolments (calculated separately for entrants direct from school & other entrants) - (can only be calculated when all or most entrants apply through central agencies - in other cases, calculate ratio of direct applications to commencing enrolments)
(ii) Offers Ratio	No. of offers divided by commencing enrolments (calculated separately for entrants direct from school and other entrants)
- for undergraduate awards - continuing students	
(iii) Second year retention	Ration of second to first year enrolments in same subject or department
(iv) Major sequence retention	Ration of students completing a major in a subject/discipline to first year commencers in same subject/discipline
- for postgraduate coursework courses	
(v) Application Ratio	Ratio of applications to commencements

(Table 1. Cont.)

INDICATOR	DEFINITION
(b) Quality of Intake	
Average entrance score	Entrance score associated with the median of scored entrants, as an indicators of the average
(c) Types of entrants for undergraduate commencing students	Direct from school, TAFE, mature age, etc.
(d) Numbers	
(i) Load	Equivalent full-time student units (total)
(ii) Numbers of commencers	DEET definition of commencing students
Resource Management	
(a) Sources of income	Commonwealth grants, other Commonwealth sources, private funds, etc.
(b) Student/Staff Ratio	Academic activities (teaching and research), academic activities (research), etc.
(c) Recurrent expenditure priorities	Academic activities (teaching and research), academic activities (research), etc.
(d) Priorities in teaching and research	Funds expended on academic salaries, academic activities general salaries (tech.), general salaries (admin.) equipment, other

TABLE 2: PERFORMANCE INDICATORS

INDICATOR	DEFINITION
Student Demand	
- for undergraduate awards - commencing students	
(a) Preference ratio	No. of first preferences divided by commencing enrolment (calculated separately for entrants direct from school & other entrants) - (can only be calculated when all or most entrants apply through central agencies - in other cases, calculate ratio of direct applications to commencing enrolments)
(b) Offers ratio	No. of offers divided by commencing enrolments (calculated separately for entrants direct from school and other entrants)
- for undergraduate awards - continuing students	
(c) Second year retention	Ratio of second to first year enrolments in same subject or department
(d) Major sequence retention	Ratio of students completing a major in a subject/discipline to first year commencers in same subject/department
- for postgraduate coursework courses	
(e) Application ratio	Ratio of applications to commencements
Quality of Intake	
(a) Average entrance score	Entrance score associated with the median of scored entrants, as an indicator of the average
Student Evaluations of Teaching and Curriculum	
(a) Perceived quality and relevance of teaching and curriculum	Rating by students on small no. of aspects of teaching/subjects (to be defined)
(b) Commitment to teaching	No. of formative evaluations (excluding those for the overall evaluation in (a)) of subjects and departments per EAS

(Table 2. Cont.)

INDICATOR	DEFINITION
Completion Rate	(may be valuable for indicators to be calculated separately for various sub-groups, eg. by gender)
- for undergraduate and postgraduate coursework	
(a) Minimum time	Proportions of commencing students completing in minimum time
(b) Eventual completion	No. of Students eventually completing as a proportion of commencing students
- for postgraduate research	
(a) Minimum time	Proportion of students completing within 2 years for Masters & 4 years for PhD
(b) Eventual completion	Proportion of students eventually completing Masters & PhD courses
Destination and Acceptance of Graduates	
(a) Employability	Proportion employed, unemployed, or in further study, type of work, salary
(b) Acceptance	Comparative employability of specific courses
(c) Graduate satisfaction & relevance	Small no. of rating scales to be defined
Research Grants	
(a) Numbers which allocate grants by peer review	No. of grants per EAS in - . Commonwealth granting bodies . Foundations, overseas & non-Government bodies which allocate grants by peer review . Contract research & industry contributions . Other research funding
(b) Dollar value	As for (a)

(Table 2. Cont.)

INDICATOR	DEFINITION
Publications	
(a) Books	No. published per academic staff
(b) Edited books	No. published per academic staff
(c) Refereed chapters in books	No. per academic staff
(d) Refereed articles	No. per academic staff
(e) Conference papers	No. published (in proceedings) per academic staff
(f) Unpublished papers, reports & conference presentations	No. per academic staff
(g) Other significant output	Including published original musical compositions, musical compositions recorded for broadcast, or on disc or tape; patents accepted; exhibitions; designs or executed buildings, per academic staff
Research Degrees Completed	
(a) PhDs	No. successfully completed over 5 years per academic staff
(b) Research Masters	No. successfully completed over 5 years per academic staff
Professional Services	
(a) Contribution to professional organisations	To be defined
(b) Consultancy to government and non-government authorities	To be defined
(c) Consultancy to industry and private organisations	To be defined
(d) Membership of expert bodies	To be defined
(e) Provision of continuing education programs	To be defined
(f) Contribution to public information media	To be defined

APPENDIX B

Specifications of Data to be included in the KOTA and University Databases in Finland

The reader is strongly advised to read the section on the developments in Finland in order to understand fully the context for the information in the Appendix.

APPENDIX B

SPECIFICATIONS OF DATA IN THE KOTA AND UNIVERSITY DATABASES
FINLAND

I. TEACHING AND RESEARCH PERSONNEL (in use)

Teaching personnel
Number of teaching posts in 19__.
- specified by appointments:
- professors
- assistant professors
- senior research fellows
- research fellows
- lecturers, senior lecturers, assistant lecturers
- lecturers (employed by the hour)
- other teaching hours
Number of university lecturers (dosentit) in 19__.

Classifications:
- university
- discipline
- department

Other personnel
Number of other than teaching personnel in 19__.
- research fellows
- assisting personnel in teaching and research
- personnel in library
- computer personnel
- administrative personnel
- other personnel

Classifications:
- university
- discipline
- department

Funding sources:
- university, external funding, research fellows of Academy of Finland, paid by the research funding from the Academy of Finland, other external funding

II. FUNDING (in use)

Closing / Balance of the books 19__.

The balance of books by heads:

01. Salaries
02. Utilization of real estate
21. Other teaching and research expenditure
    21.1. Equipment
    21.2. Literature
28. External funding / Contract research
29. Other operating expenditure
50. Grants
70. Purchases of research and teaching equipment
71. Renewal of teaching and research equipment
74. Construction
75. Repairs
88. Purchase of real estate

Classifications:
- university
- discipline
- department

III. EXTERNAL FUNDING / CONTRACT RESEARCH

Research funding which has not been in the budget in 19__.

Classifications:
- university
- discipline
- department

Sources of funding: Academy of Finland, TEKES, other governmental funding, municipality funding, public and private enterprises, foundations, societies and organizations, foreign and interntional organizations, other sources.

SCIENTIFIC ACTIVITIES

I. SCIENTIFIC PUBLICATIONS

Scientific monographs in 19__.
- published abroad
- published in Finland

Articles in 19__.
- articles published in foreign scientific journals, in edited books and in congress publications (number, pages)
- articles in domestic scientific journals, in edited books and in congress publications (number, pages)

Other scientific publications in 19__.
- other published publications abroad and in serials and scientific monographs
- general books, teaching books, (excluding articles in newspapers, book reviews etc.)
- other publications in domestic serials (number, pages)

Classifications:
- university
- discipline
- department

II. CONGRESS PRESENTATIONS

Number of lectures given abroad in 19__.
- in scientific meetings (general presentations, by invitations, number)
Number of presentations in Finland in 19__.

Classifications:
- university
- discipline
- department

III. SCIENTIFIC EXPERTISE TASKS

Number of teachers and research fellows as editors of scientific foreign journals in 19__.
Number of teachers and research fellows as editors of domestic scientific journals in 19__.
Number of teachers and research fellows as editors of books in 19__.
Number of teachers and research fellows as members in foreign scientific societies in 19__. (chairperson, vice chaiperson, secretary)
Number of teachers and research fellows as members of domestic scientific societies in 19__.
Number of teachers and research fellows as adversaries in 19__.
Statements (reports) given by the teachers and research fellows in 19__. (for appointments of professors, assistant professors, and research professors)

Classifications:
- university
- discipline
- department

IV. TEACHERS AND RESEARCH FELLOWS WORKING ABROAD IN UNIVERSITIES AND RESEARCH INSTITUTES

Number of teachers and research fellows in 19__. (over a month)

Classifications:
- university
- discipline
- department

V. FOREIGN RESEARCH FELLOWS WORKING IN FINNISH UNIVERSITIES

Number of research fellows in 19__. (over a month)

Classifications:
- university
- discipline
- department

APPENDIX C

Performance Indicators Recently Proposed in the Netherlands

The reader is strongly advised to read the section on developments in the Netherlands in order to understand the context (or and to properly interpret this Appendix).

APPENDIX C

PROPOSED INDICATORS AND VARIABLES

	Indicators quantitative	Qualitative Variables
TEACHING	- structure of staff by age - percentage of staff with given number of years of working experiences - staff mobility - average number of publications by department - number of staff with completed dissertations by faculty (universities)	- educational qualifications of staff - staff's motivation to teach - staff-recruitment policy
educational climate	- amount of time, means and results of institutionalized activities towards educational innovation	- educational philosophy - innovative orientation
infrastructure and material facilities	- amount of hard-ware by faculty, by HVE-institute (e.g. computers) - amount of software in audio-visual centre by member of staff, by faculty, by HVE-institute (e.g. computer programmes)	- quality of teaching space used
educational supply		- scope of freedom-of-choice curriculum (subjects, modules) in relation to the volume of the compulsory curriculum - range of choice of major subjects - supply of fields of study: regular, free and experimental - possibilities for part-time training, in-service training contract - education, postacademic training

	Indicators quantitative	Qualitative Variables
curriculum		- effectivity of procedures for development on revision of existing programmes or new courses - clarity in and clear descriptions of the aims of the course - relevance of the aims of the course with regard to professional reality - agreement between content and aims of the curriculum - realization of the curriculum functions - correctness, plausibility, completeness and level of the aims of the curriculum
policy		- institutional system of quality assurance - agreement with other institutions concerning distribution and concentration of tasks - democratic implementation of policy
student flow	- number of students passing propedeutic examination by field of study (percentage) - passed "doctoral" examination by field of study - time spent by field of study - drop-out percentage	
student outflow	- average time-lag between graduation and first job by field of study - unemployed/graduates ratio field of study - percentage of graduates with completed dissertations after x-years by faculty (universities)	- relevance of education in relation to professional activities x-years after graduation (higher vocational education) - demand for/supply of trainee places, graduation assignments from the labour market (higher vocational education) - adequacy of the output "graduate" with regard to the labour market and society

	Indicators quantitative	Qualitative Variables
RESEARCH	- internal and external mobility of research personnel	- availability of competent guidance for research - personal policy: recruitment; current personnel
material means	- number of research grants received, funding from Ministry Research agencies and private sector by HVE-institute - percentage of research expenditure by institution	
organisation and implementation of research		- aims of the program: practicability, foundations - scope of the program, considering it's aims - scientific value of the program (universities)
policy		- evaluation of research by the institute - relation between aims of research and recent policy plans concerning that particular field of interest - stimulation of research by the institution
collaborations		- interdisciplinary research collaboration with institutes and research stations - international contracts through accomplished research (universities) - contacts with relevant projects (national, international)

Indicators quantitative	Qualitative Variables
publication and citation data - number of scientific publications in (inter-) national journals by year - number of articles in (inter-)national journals with reference systems by year - number of dissertations by year (universities)	- quality of the publication
potential merits	- usefulness of research results for trade and industry - usefulness of research results for education - scientific merits: research results generate new understandings, solve fundamental problems in scientific know-how - esteem on national and international level (universities)

SERVICES

Indicators quantitative	Qualitative Variables
external services	- research on behalf of government, companies, societies - relations with external organisations - contract education - contract research - permanent-educational activities for outsiders: number, duration, participation - circulation of scientific results for the population - use of facilities by departments, by HVE-institutions in the process of amalgamation, by other major courses - study counselling and information - tutoring

APPENDIX D

Various Displays Concerning Performance Indicators in the United Kingdom

The reader is strongly urged to read the section concerning developments in the United Kingdom in order to understand the context for and to be able to interpret the material in this Appendix.

APPENDIX D1

PERFORMANCE INDICATORS IN GENERAL USE IN UNIVERSITIES

1. Number of applications per undergraduate place
2. Entry score of the undergraduate intake
3. Classification of or number of honours degrees awarded
4. Student wastage rates
5. Staff workload (as measured by typical contact hours, courses taught, class sizes and administrative responsibilities of staff)
6. Employability of graduates
7. Postgraduate completion rates
8. Research grants and contracts
9. Research studentships awarded by particular bodies eg. Research Councils, British Academy, SED
10. Records of publications
11. Student load and analysis of student numbers
12. Staff student ratio
13. Unit costs
14. Staff numbers according to category
15. Institutional income and expenditure
16. Departmental equipment and recurrent grant and expenditure

Appendix D2

Initial range of Performance Indicators

INDICATOR	Implementation Time Scale		
	1986/87	Near Future	Future
Teaching and Research			
Cost per FTE student	X		
Research income	X		
Contribution to postgraduate and professional training	X		
Submission rates for research degrees	X		
Number of research and sponsored students	X		
Occupation of graduates after 12 months	X		
Undergraduate wastage rates		X	
Occupation of graduates after 5 years			X
Analysis of publications/patents/agreements/ copyrights			X
Citations			X
Peer review			X
Editorship of journals/officers of learned bodies			X
Membership of research councils			X
Costs per graduate			X
FTE students to FT academic staff	X		
Equipment costs per FT academic staff	X		
Others			
Administrative costs per FTE student	X		
Premises costs per FTE student	X		
Library costs per FTE student	X		
Careers services costs per FTE student	X		
Medical services costs per FTE student	X		
Sports facilities costs per FTE student	X		
Other central costs per FTE student	X		
Ratio of support staff to academics	X		

Appendix D2 (continued)

Initial range of Performance Indicators

INDICATOR	Users of Performance Indicators		
	Department	Cost Centre	Institution
Teaching and Research			
Cost per FTE student	X	X	X
Research income	X	X	X
Contribution to postgraduate and professional training	X	X	X
Submission rates for research degrees	X	X	
Number of research and sponsored students	X		
Occupation of graduates after 12 months	X		X
Undergraduate wastage rates	X		X
Occupation of graduates after 5 years	X		X
Analysis of publications/patents/agreements/ copyrights	X		
Citations	X		
Peer review	X		
Editorship of journals/officers of learned bodies	X		
Membership of research councils	X		X
Costs per graduate	X	X	X
FTE students to FT academic staff	X	X	X
Equipment costs per FT academic staff	X	X	X
Others			
Administrative costs per FTE student			X
Premises costs per FTE student			X
Library costs per FTE student			X
Careers services costs per FTE student			X
Medical services costs per FTE student			X
Sports facilities costs per FTE student			X
Other central costs per FTE student			X
Ratio of support staff to academics	X	X	X

Appendix D3

Excerpt RE:

FORMULATION OF TEACHING AND RESEARCH INDICATORS

UNDERGRADUATE WASTAGE RATE

1. Definition

   (a) proportion of full time students not progressing to the next year of their course (proportion of students admitted to year x not entering year x + 1);

   (b) proportion of full time students not completing their courses within the minimum period required to graduate plus 2 years.

2. Applicability

   (a) applicable as an internal management tool to compare similar or cognate departments eg. biological sciences, modern languages.

   (b) applicable in the inter-institutional dimension.

3. Usefulness

   (a) useful and necessary for planning purposes

   (b) useful as a means of monitoring the success of an institution in the output of graduates.

   In practice, there may be problems in use at the departmental or cost centre level because:

   (a) the number involved at this level would generally be small and it would be extremely difficult to distinguish between genuine differences and random effects;

   (b) it is difficult to see how wastage could be ascribed to a department in the case of multidisciplinary courses or ordinary degree programmes;

   (c) in the case of those institutions where entry into alternative courses to that stipulated on offer of place or admission to the university is relatively easy and/or common (for example, in faculty entry in the ancient Scottish universities or in some of the colleges of the University of Wales) "wastage" at departmental level does not have the same meaning as elsewhere. However, the ability of an individual department to retain intending degree students may lead to useful questions being posed internally.

4. Caveats, comments, advice

One clear danger in using undergraduate wastage rate as a performance indicator is that it could lead to institutions adopting an increasingly cautious admissions policy, for example by admitting fewer mature students or fewer applicants with non-standard qualifications.

It cannot be assumed that a person who leaves an institutions without gaining a degree has achieved no benefit, either in personal terms or in subsequent career terms, from the time spent in higher education.

5. Further action

Discussions are to be held with USR to assess the feasibility of constructing the indicator from information currently collected. It will be necessary to consider whether transfers between institutions are so numerous that some account of these needs to be built in to avoid presenting distorted figures. (Transfers within the university sector could possibly be recorded, but this would be difficult between sectors). Later development could involve extending the indicator to cover part-time students.

DESTINATION OF GRADUATES

1. Definition

(a) Occupation 12 months after graduation.

(b) Occupation 5 years after graduation as a guide to career development.

2. Applicability

Applicability at the inter-institutional level would be limited unless adjustments are made for subject mix. However, this indicator could be used to compare the same disciplines at different institutions, or across the sectors.

3. Usefulness

(a) This could be enhanced if:

(i) the collection of destination information were undertaken at nine or twelve months after graduation, rather than after six months;
(ii) all universities were to adopt a standard method of eliciting information;
(iii) USR were to undertake the coding and analysis of all returns.

(b) Longer term destination analysis could be an important future development, although this is seen as being a task for the DES, rather than the universities, USR, AGCAS or the UGC. Regular longitudinal or cohort studies to investigate career patterns of graduates should be undertaken.

4. Caveats, comments, advice

Comparisons of destinations between institutions without subjet mix corrections being applied are bound to be misleading. Institutions in different geographical areas could show different destination patterns, even after subject mix correction, in response to regional job markets.

Appendix D4

University Management Statistics and Performance Indicators
(CVCP: 1989 Edition)

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Issues in Quantitative Assessment of Departmental Research

CVCP/UFC Performance Indicators Steering Committee
Sub-Committee on Research Indicators

I. INTRODUCTION

The current emphasis on greater selectivity and greater accountability in universities has given rise to considerable interest in performance indicators -- quantitative or semi-quantitative data that can be put alongside qualitative assessments in forming judgements about performance. The CVCP and UFC have established a joint committee to investigate performance indicators. A separate subcommittee is examining research. This paper seeks views on how best to develop certain potential indicators of research performance.

Assessment of individual performance (or potential) is a central feature of academic life -- giving places to students, awarding degrees, appointing or promoting staff, accepting papers for publication and awarding research grants are the most evident examples. Performance indicators have a slightly different purpose, in that relatively objective data can be used both to assist the forming of judgements and to strengthen their public acceptability. Moreover, these indicators tend to operate best at the institutional or departmental rather than the individual level.

This paper is concerned with indicators of the outputs and outcomes of research. An overall assessment of research performance must, of course, also pay attention to the inputs (money, people, equipment etc) and to the processes by which inputs generate outputs. One needs, at the very least, to express data in terms of output per unit input, and this is one of the aims of the CVCP/UFC subcommittee. It is however useful to separate the various stages when considering how best to tackle them.

There are several different types of output from research; new knowledge, new linkages with outside groups, newly trained people, etc. This paper is concerned solely with ways of quantifying the generation of new knowledge.

The CVCP/UFC subcommittee is charged in the first instance with establishing the groundrules for the regular compilation of statistics on the outputs and outcomes of university research. The aim is to build up a reasonably comprehensive database which, over time, will give a reliable picture of the way university research is evolving. It is hoped that the database will provide a firm factual basis for discussion of both the volume and, to some extent, the quality of university research.

II. VOLUME OF RESEARCH OUTPUT

New knowledge and new ideas generated within the academic sector normally reach published form at some stage. Commercial and other confidential material is not published, but to a first approximation one may assume that the output of new knowledge by the academic sector can be monitored by careful analysis of publications. It is therefore of interest to establish agreed procedures for measuring the volume of published output, and to determine the extent to which the results fairly represent the volume of research output.

The CVCP/UFC subcommittee has already undertaken a trial exercise to count the amount of published material, with the main object of encouraging universities to set up appropriate databases for future use. In autumn 1988, all university departments of chemistry, economics, history and physics were asked to provide comprehensive lists of their published output for the calendar year 1987. Respondents provided extensive data; many also commented on such issues as the types of publications to be included, the inclusion or exclusion of particular categories of staff (for determining what should count towards total departmental output), multiple authorship, the period over which data should be collected and difference between science and humanities disciplines. The experience thus gained is now being developed in a second trial exercise focused on the disciplines of accountancy, chemical engineering, dentistry and French.

III. QUALITY OF RESEARCH OUTPUT

Achieving a degree of consensus on how to measure the volume of research output, complex as that may be, is not enough to produce an adequate statistical description of academic research. One should also tackle the more difficult issue of quality. There is at the present time no objective, quantitative measure of quality applicable to academic research. One is therefore faced with devising surrogate measures and defining the limits within which they are useful.

Some flexibility will be necessary here. In the humanities, for example, the judgements applied to the various elements of a publications count are likely to differ markedly from those used for science disciplines. The same applies to measures of quality: a surrogate measure may prove acceptable in one field but not in another.

The UFC already has some relevant experience in this field. In connection with implementation of the Oxburgh report on university earth science, all relevant departments were asked to provide comprehensive lists of published output for the previous ten years, and citation data for the previous five years. In addition to its value for the Oxburgh implementation, this exercise provided unique experience in bibliometric analysis based on comprehensive data provided by the departments themselves.

IV. CITATION ANALYSIS

The best measure used as a surrogate for "quality" is citation analysis. One would not equate citations with quality in any simple, linear fashion: there are several reasons why the most creative or far-reaching papers are not necessarily the ones that are cited most frequently. But it can reasonably be argued that highly cited papers have a significant impact on the development of their fields. There is a good deal of evidence to support the thesis that, if one is dealing with large enough groups -- say those producing more than 50 papers per year (the threshold number depends on the discipline) -- or with a stable group over a number of years, there is a correlation between measures such as average citations per paper and the reputation of the group among its peers.

There are several different forms of citations analysis. The one most appropriate to the present context involves producing a comprehensive list of a department's output and then counting (by reference to the Science Citation Index, the Social Sciences Citation Index) how often each item is cited during, say, the first three years after publication. Due account must be taken of the proportion of items in the list that is other than papers in journals scanned by the various citation indices.

The advantages of citation analysis along these lines include:

- that it gives reproducible results about a factor other than the sheer volume of research output. It thereby adds an important additional perspective to the picture produced by the counting of publications. The bibliometric study of university earth science, for example, found no significant correlation between the total departmental output of publications, or the average output per member of staff, on the one hand, and the average number of citations received by each publication on the other. An assessment based solely on publication counts may therefore give a misleading impression;

- once the analysis has been going long enough to allow calculation of rolling averages, it gives trend data;

- if desired, self-citation or own-group citation can be eliminated;

- in addition to the basic calculation of average citations per publication, complementary indicators can be derived, such as the proportion of publications that are highly, or never, cited.

Disadvantages include:

- that it is labour-intensive, even if some aspects are computerized;

- that one has to wait at least three years after publication before assessing the citation performance of a publication, which means that the results may reflect projects initiated five or more years previously, sometimes by people no longer in the department;

- that some departments may be too small to generate a statistically usable number of publications and citations;

- that publications in sources not scanned by the Institute for Scientific Information (which produces the citation indexes) are ipso facto considerably more likely to have their citation records underestimated by the indexes. This is not a problem just for the humanities: 44 per cent of publications by university earth sciences departments are not scanned by ISI;

- that citation practice (as well as publication practice) may vary so much between fields, and especially between science and the humanities, that the results have to be interpreted in different ways.

Citation analysis would thus appear to have some value in the present context. It is a partial indicator of the impact of the published output of research, and is capable of generating a variety of useful measures such as citations per paper, numbers of highly cited papers, numbers of uncited papers. It is most reliable when applied to the larger departments or to departments that are stable over time. The more obvious abuses (eg excessive self-citation) can be circumvented. On the other hand, one has to wait several years before the citation record of a paper becomes apparent. Moreover, citation analysis may be less relevant to those disciplines where the typical form of published output is not a paper in a referred journal. It is therefore open to discussion whether the insights generated by citation analyses are worth the effort and cost of collecting and analysing the data.

V. ESTEEM INDICATORS

In attempting to quantify the quality of a department's research, it is important where possible to build up a portfolio of surrogate measures. Where the various measures prove to be mutually consistent, one can build up a composite picture with a reasonable degree of reliability. A complementary approach to citation analysis is to examine variables that can be interpreted as measures of the esteem in which the department as a whole or its individual members are held. Possibilities include:

- membership of learned societies at a level where admission is by competitive election only (eg FBA, FRS, FEng);

- major prizes;

- numbers of visiting scholars supported by formal schemes;

- journal editorships.